Appendix B

E-UTRA Band 13

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

CONTENT

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1   Effective (Isotropic) Radiated Power Output Data

Effective Radiated Power of Transmitter (ERP) for LTE BAND 13

Test Band(LTE)	Test Mode	Test Bandwidth	Test channel	Test RB	Measured (dBm)	ERP (dBm)	limit (dBm)	Verdict
BAND 13	LTE/TM1	5M	LCH	1RB#0	22.9	15.85	34.77	PASS
				1RB#12	22.88	15.83	34.77	PASS
				1RB#24	22.86	15.81	34.77	PASS
				12RB#0	21.91	14.86	34.77	PASS
				12RB#6	21.91	14.86	34.77	PASS
				12RB#13	21.94	14.89	34.77	PASS
				25RB#0	21.93	14.88	34.77	PASS
			MCH	1RB#0	22.93	15.88	34.77	PASS
				1RB#12	22.88	15.83	34.77	PASS
				1RB#24	22.86	15.81	34.77	PASS
				12RB#0	21.88	14.83	34.77	PASS
				12RB#6	21.89	14.84	34.77	PASS
				12RB#13	21.87	14.82	34.77	PASS
				25RB#0	21.9	14.85	34.77	PASS
			HCH	1RB#0	22.83	15.78	34.77	PASS
				1RB#12	22.79	15.74	34.77	PASS
				1RB#24	22.81	15.76	34.77	PASS
				12RB#0	21.86	14.81	34.77	PASS
				12RB#6	21.86	14.81	34.77	PASS
				12RB#13	21.79	14.74	34.77	PASS
				25RB#0	21.83	14.78	34.77	PASS

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Test Band(LTE)	Test Mode	Test Bandwidth	Test channel	Test RB	Measured (dBm)	ERP (dBm)	limit (dBm)	Verdict
BAND 13	LTE/TM2	5M	LCH	1RB#0	22.03	14.98	34.77	PASS
				1RB#12	22.01	14.96	34.77	PASS
				1RB#24	21.99	14.94	34.77	PASS
				12RB#0	20.99	13.94	34.77	PASS
				12RB#6	21	13.95	34.77	PASS
				12RB#13	21	13.95	34.77	PASS
				25RB#0	20.97	13.92	34.77	PASS
			MCH	1RB#0	21.88	14.83	34.77	PASS
				1RB#12	21.84	14.79	34.77	PASS
				1RB#24	21.84	14.79	34.77	PASS
				12RB#0	20.95	13.9	34.77	PASS
				12RB#6	20.95	13.9	34.77	PASS
				12RB#13	20.95	13.9	34.77	PASS
				25RB#0	20.97	13.92	34.77	PASS
			HCH	1RB#0	21.81	14.76	34.77	PASS
				1RB#12	21.76	14.71	34.77	PASS
				1RB#24	21.78	14.73	34.77	PASS
				12RB#0	20.9	13.85	34.77	PASS
				12RB#6	20.89	13.84	34.77	PASS
				12RB#13	20.83	13.78	34.77	PASS
				25RB#0	20.89	13.84	34.77	PASS

Test Band(LTE)	Test Mode	Test Bandwidth	Test channel	Test RB	Measured (dBm)	ERP (dBm)	limit (dBm)	Verdict
BAND 13	LTE/TM1	10M	MCH	1RB#0	23.02	15.97	34.77	PASS
				1RB#24	22.93	15.88	34.77	PASS
				1RB#49	22.88	15.83	34.77	PASS
				25RB#0	21.98	14.93	34.77	PASS
				25RB#12	21.95	14.9	34.77	PASS
				25RB#25	21.88	14.83	34.77	PASS
				50RB#0	21.91	14.86	34.77	PASS

Test Band(LTE)	Test Mode	Test Bandwidth	Test channel	Test RB	Measured (dBm)	ERP (dBm)	limit (dBm)	Verdict
BAND 13	LTE/TM2	10M	MCH	1RB#0	22.15	15.1	34.77	PASS
				1RB#24	22.06	15.01	34.77	PASS
				1RB#49	22.02	14.97	34.77	PASS
				25RB#0	21.04	13.99	34.77	PASS
				25RB#12	21.03	13.98	34.77	PASS
				25RB#25	20.96	13.91	34.77	PASS
				50RB#0	21	13.95	34.77	PASS

Note:
a: For getting the ERP (Efficient Radiated Power) in substitution method, the following formula should be taken to calculate it,

ERP [dBm] = SGP [dBm] – Cable Loss [dB] + Gain [dBd]
b: SGP=Signal Generator Level

2 Peak-to-Average Ratio

Part I - Test Results

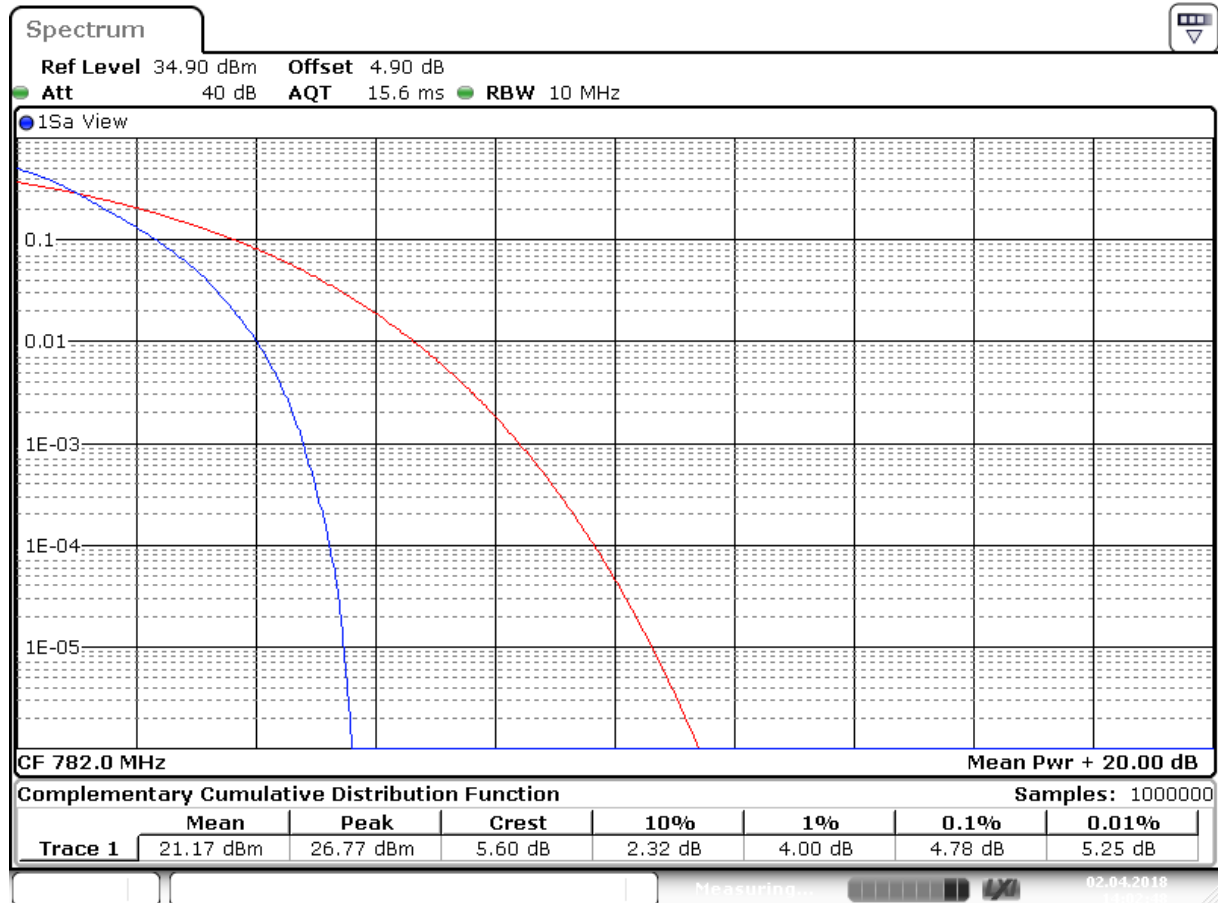| Test Band	Test Mode	Test Channel	Measured[dB]	Limit [dB]	Verdict
BAND 13	TM1/10M	MCH	4.78	13	PASS
	TM2/10M	MCH	5.77	13	PASS

Part II - Test Plots

2.1 For LTE

2.1.1 Test Band = LTE BAND 13

2.1.1.1 Test Mode = LTE/TM1.Bandwidth=10MHz
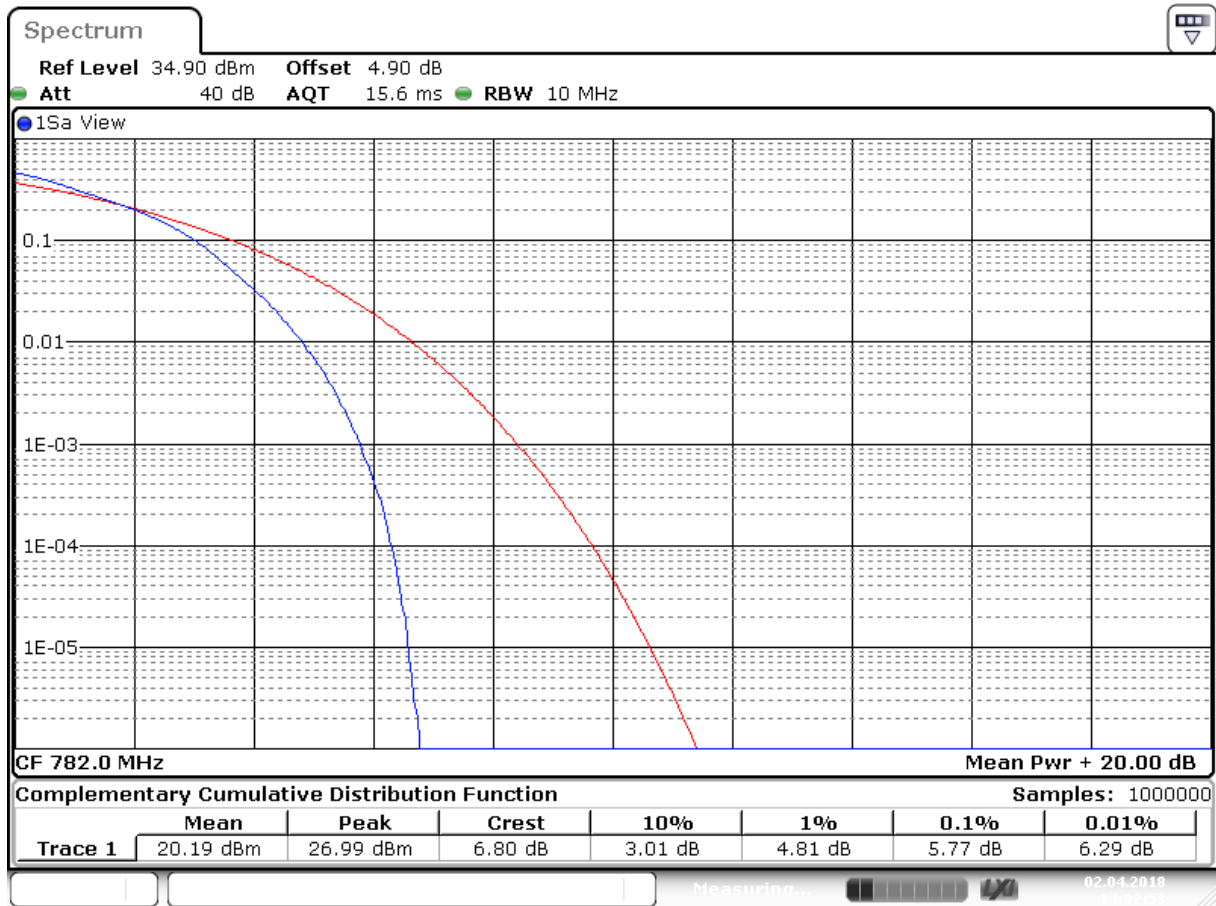
2.1.1.1.1 Test Channel = MCH

Spectrum

Ref Level 34.90 dBm   Offset 4.90 dB
Att   40 dB   AQT   15.6 ms   RBW 10 MHz
1Sa View

CF 782.0 MHz   Mean Pwr + 20.00 dB

Complementary Cumulative Distribution Function   Samples: 1000000

	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	21.17 dBm	26.77 dBm	5.60 dB	2.32 dB	4.00 dB	4.78 dB	5.25 dB

Date: 2 APR 2018 14:02:48

2.1.1.2   Test Mode = LTE/TM2.Bandwidth=10MHz

2.1.1.2.1   Test Channel = MCH

Spectrum							
Ref Level 34.90 dBm Offset 4.90 dB							
Att 40 dB AQT 15.6 ms RBW 10 MHz							
1Sa View							

CF 782.0 MHz — Mean Pwr + 20.00 dB

Complementary Cumulative Distribution Function — Samples: 1000000

	Mean	Peak	Crest	10%	1%	0.1%	0.01%
Trace 1	20.19 dBm	26.99 dBm	6.80 dB	3.01 dB	4.81 dB	5.77 dB	6.29 dB

Date:2 APR.2018 14:02:54

3   Modulation Characteristics

3.1 For LTE

3.1.1 Test Band = LTE BAND 13

3.1.1.1   Test Mode = LTE /TM1 10MHz

3.1.1.1.1   Test Channel = MCH
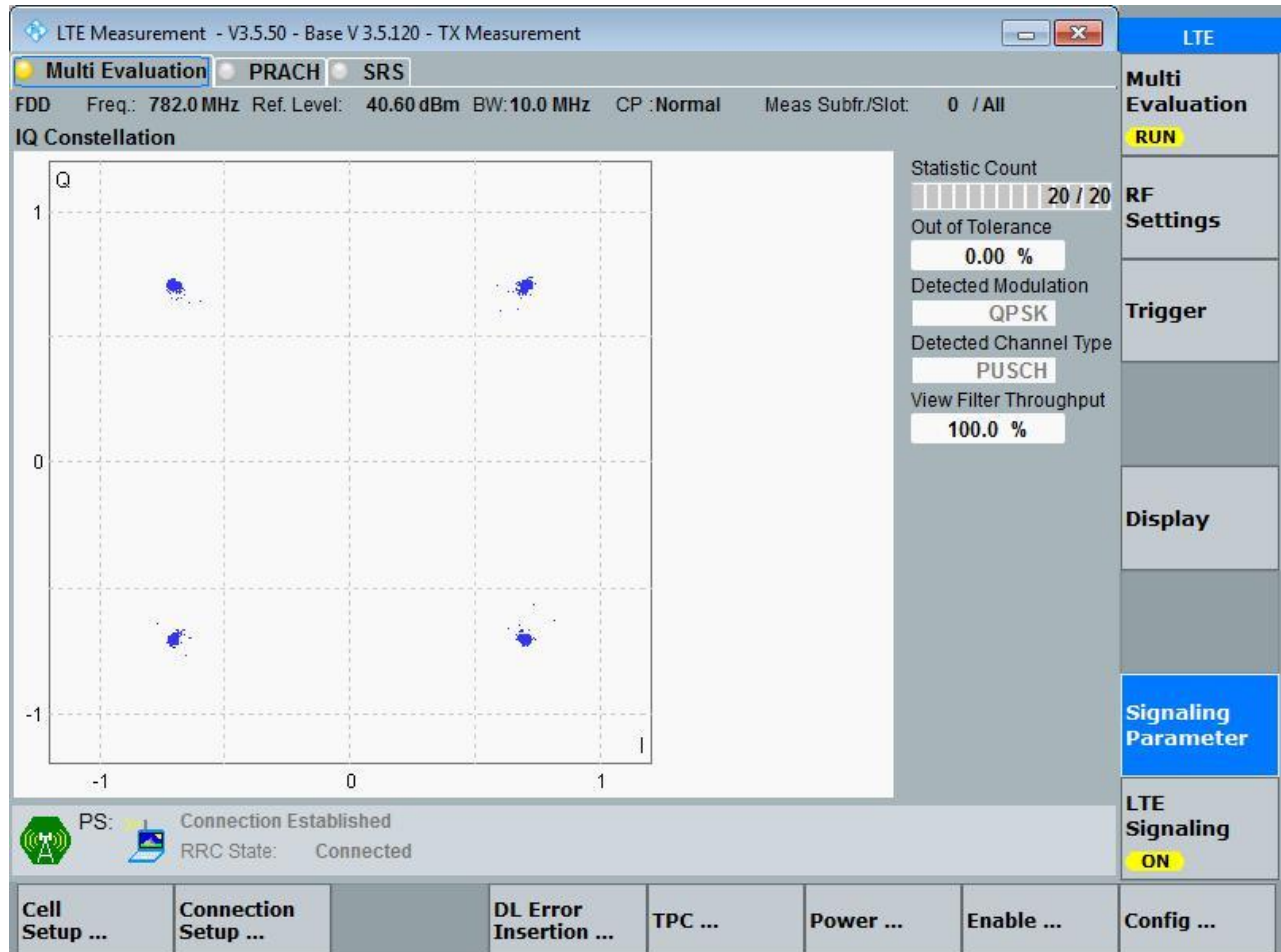
3.1.1.2 Test Mode = LTE /TM2 10MHz

3.1.1.2.1 Test Channel = MCH

**SGS-CSTC Standards Technical Services Co., Ltd.
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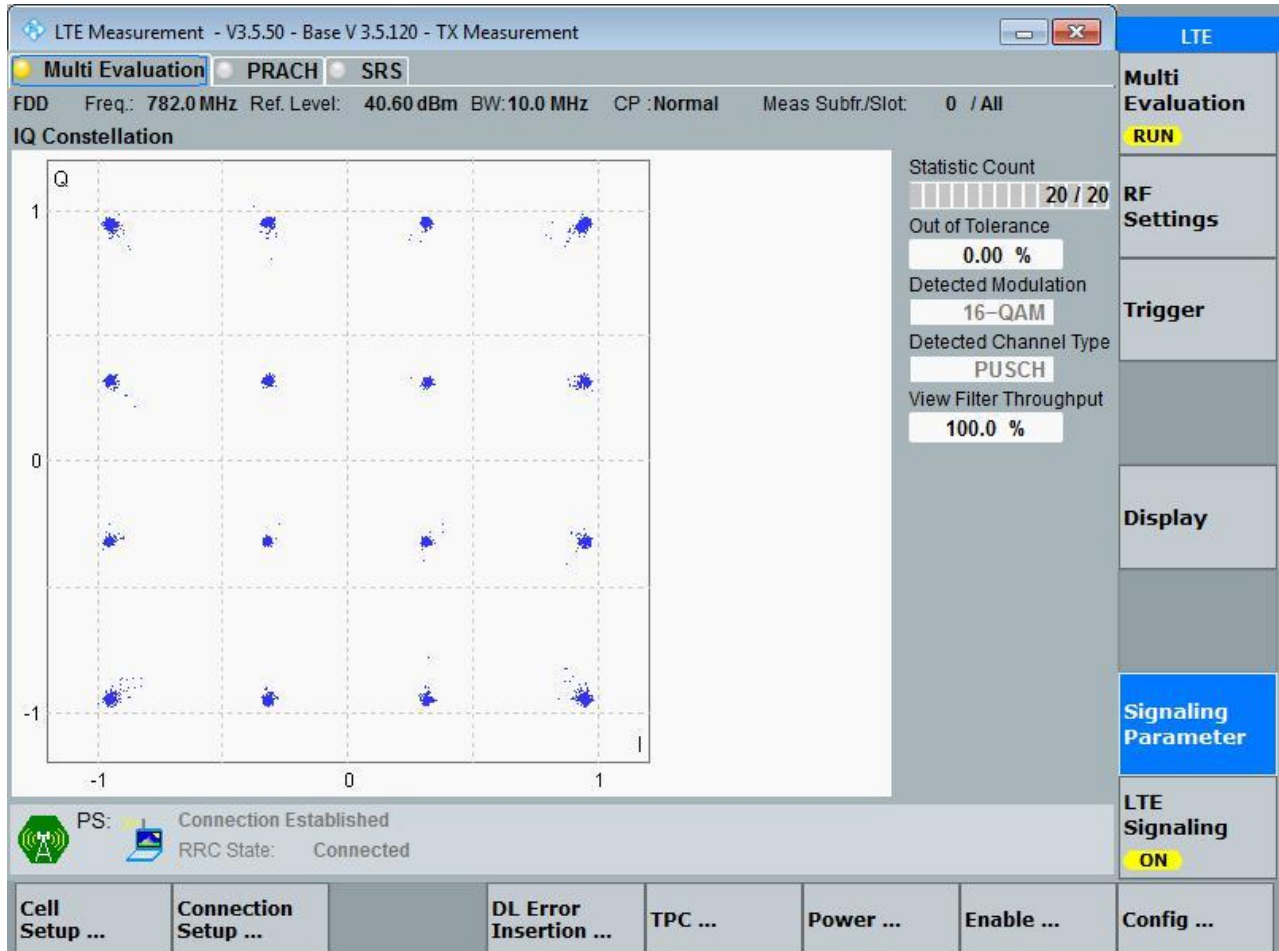
4 Bandwidth

Part Ⅰ - Test Results

Test Band	Test Mode	Test Channel	Occupied Bandwidth [MHz]	Emission Bandwidth [MHz]	Verdict
BAND 13	TM1/ 5MHz	LCH	4.476	4.740	PASS
		MCH	4.466	4.740	PASS
		HCH	4.466	4.730	PASS
	TM2/ 5MHz	LCH	4.476	4.740	PASS
		MCH	4.476	4.750	PASS
		HCH	4.476	4.740	PASS
	TM1/10MHz	MCH	8.931	9.280	PASS
	TM2/ 10MHz	MCH	8.911	9.300	PASS

Part Ⅱ –Test Plots

4.1 For LTE

4.1.1 Test Band = LTE BAND 13

4.1.1.1 Test Mode = LTE/TM1 5MHz

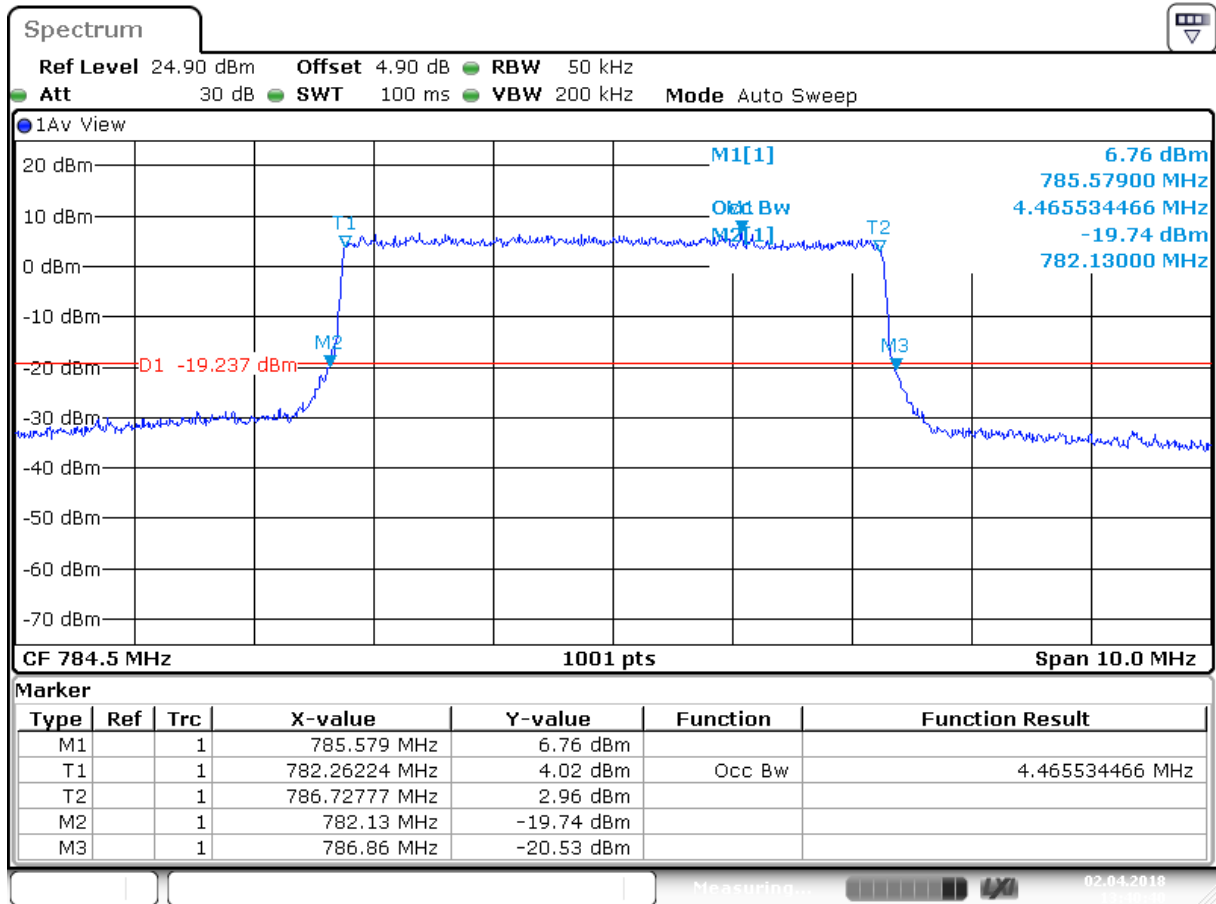##### 4.1.1.1.1 Test Channel = LCH

Date:2 APR 2018 13:39:27

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4.1.1.1.2 Test Channel = MCH

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	782.23 MHz	7.10 dBm		
T1		1	779.77223 MHz	4.10 dBm	Occ Bw	4.465534466 MHz
T2		1	784.23776 MHz	4.71 dBm		
M2		1	779.64 MHz	-20.09 dBm		
M3		1	784.38 MHz	-19.14 dBm		
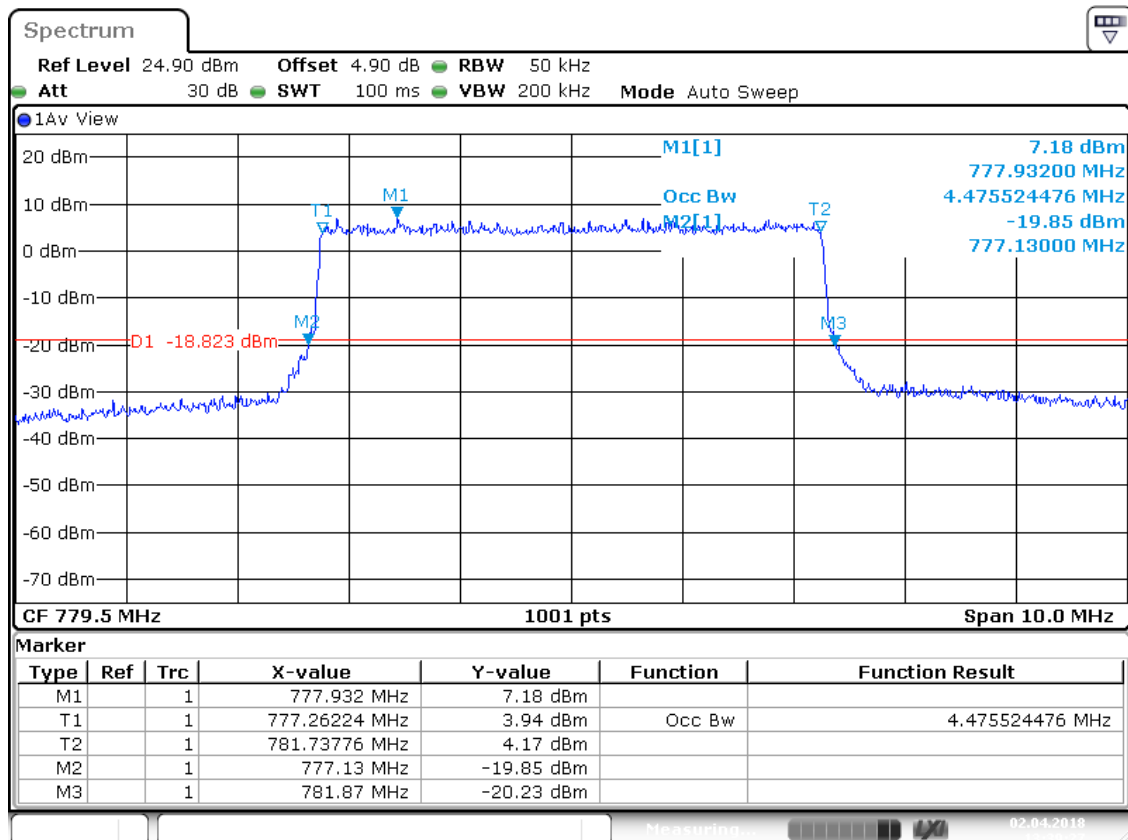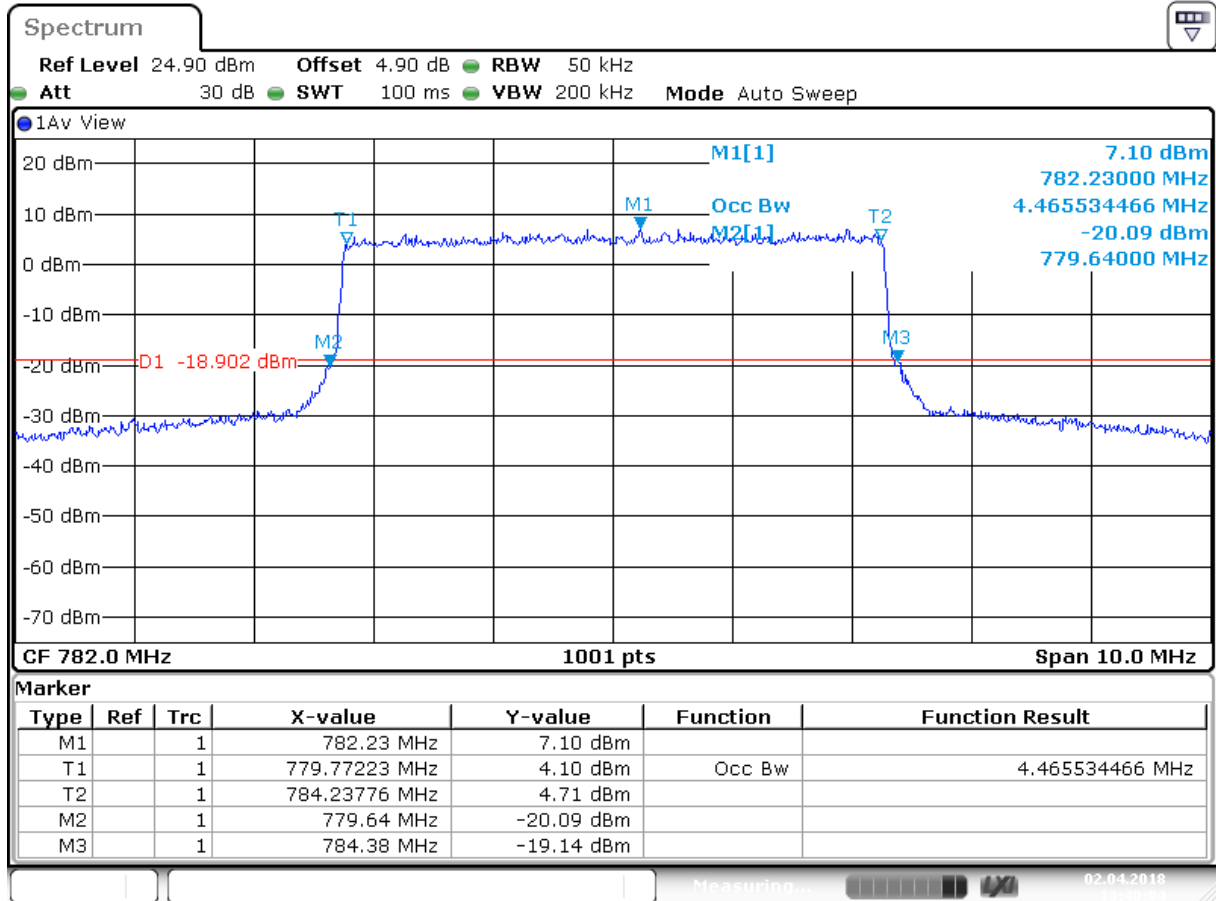
Date:2.APR.2018 13:40:04

4.1.1.1.3   Test Channel = HCH

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	785.579 MHz	6.76 dBm		
T1		1	782.26224 MHz	4.02 dBm	Occ Bw	4.465534466 MHz
T2		1	786.72777 MHz	2.96 dBm		
M2		1	782.13 MHz	-19.74 dBm		
M3		1	786.86 MHz	-20.53 dBm		

Date: 2 APR 2018 13:40:41

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4.1.1.2   Test Mode = LTE/TM2 5MHz

4.1.1.2.1   Test Channel = LCH

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	781.718 MHz	5.97 dBm		
T1		1	777.26224 MHz	3.10 dBm	Occ Bw	4.475524476 MHz
T2		1	781.73776 MHz	4.30 dBm		
M2		1	777.14 MHz	-20.95 dBm		
M3		1	781.88 MHz	-20.31 dBm		
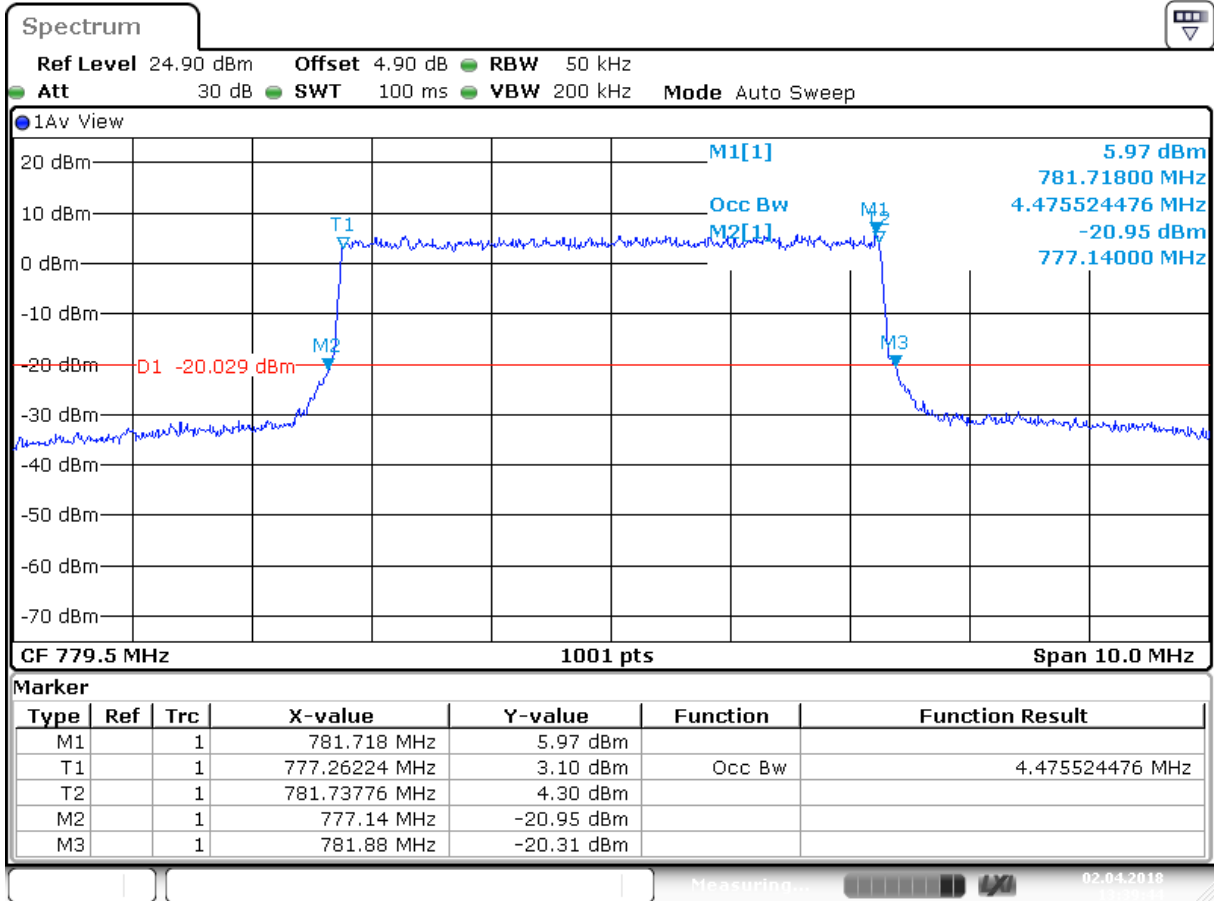
Date: 2 APR 2018 13:39:44

4.1.1.2.2   Test Channel = MCH

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	783.259 MHz	6.09 dBm		
T1		1	779.76224 MHz	1.35 dBm	Occ Bw	4.475524476 MHz
T2		1	784.23776 MHz	2.68 dBm		
M2		1	779.63 MHz	-20.42 dBm		
M3		1	784.38 MHz	-20.50 dBm		
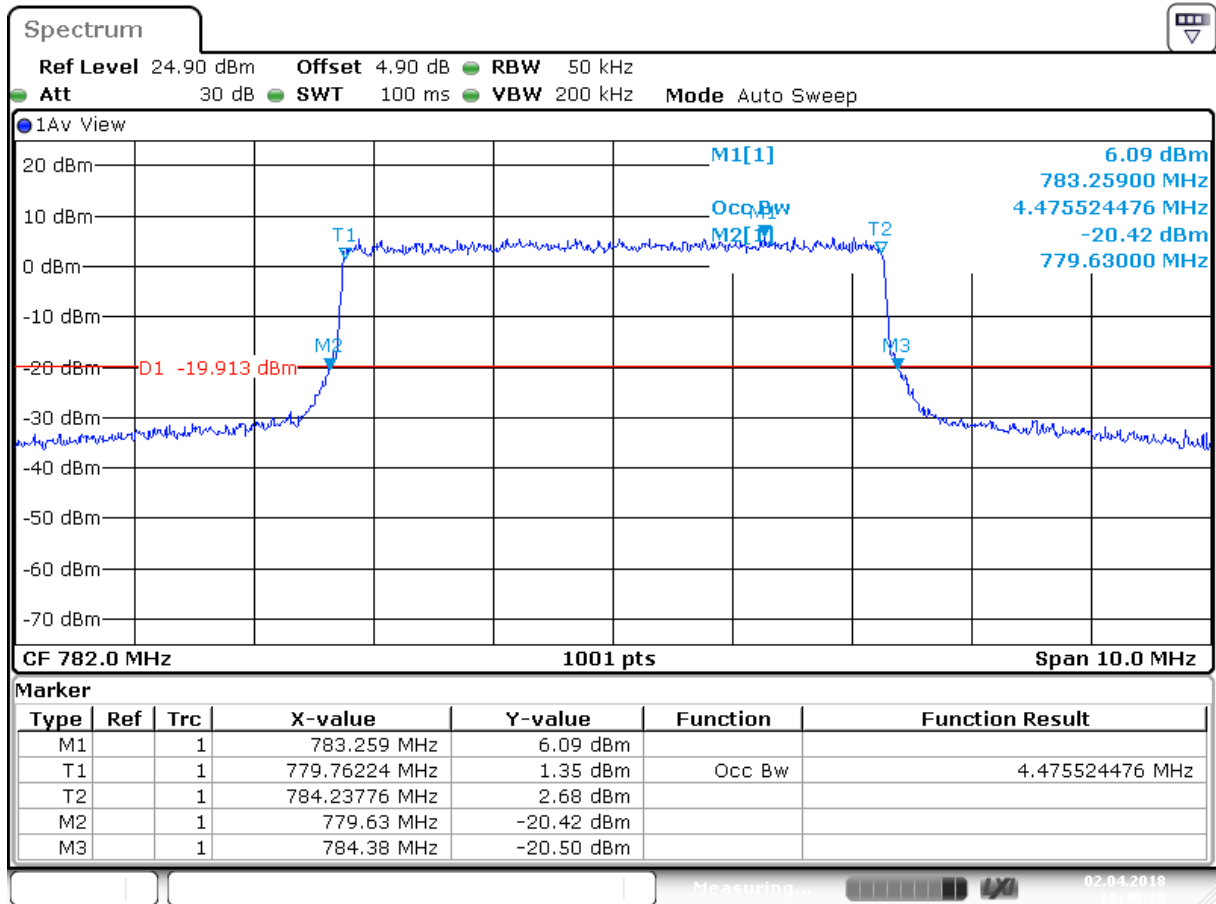
Date: 2 APR 2018 13:40:21

4.1.1.2.3   Test Channel = HCH

Date: 2 APR 2018 13:40:57

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
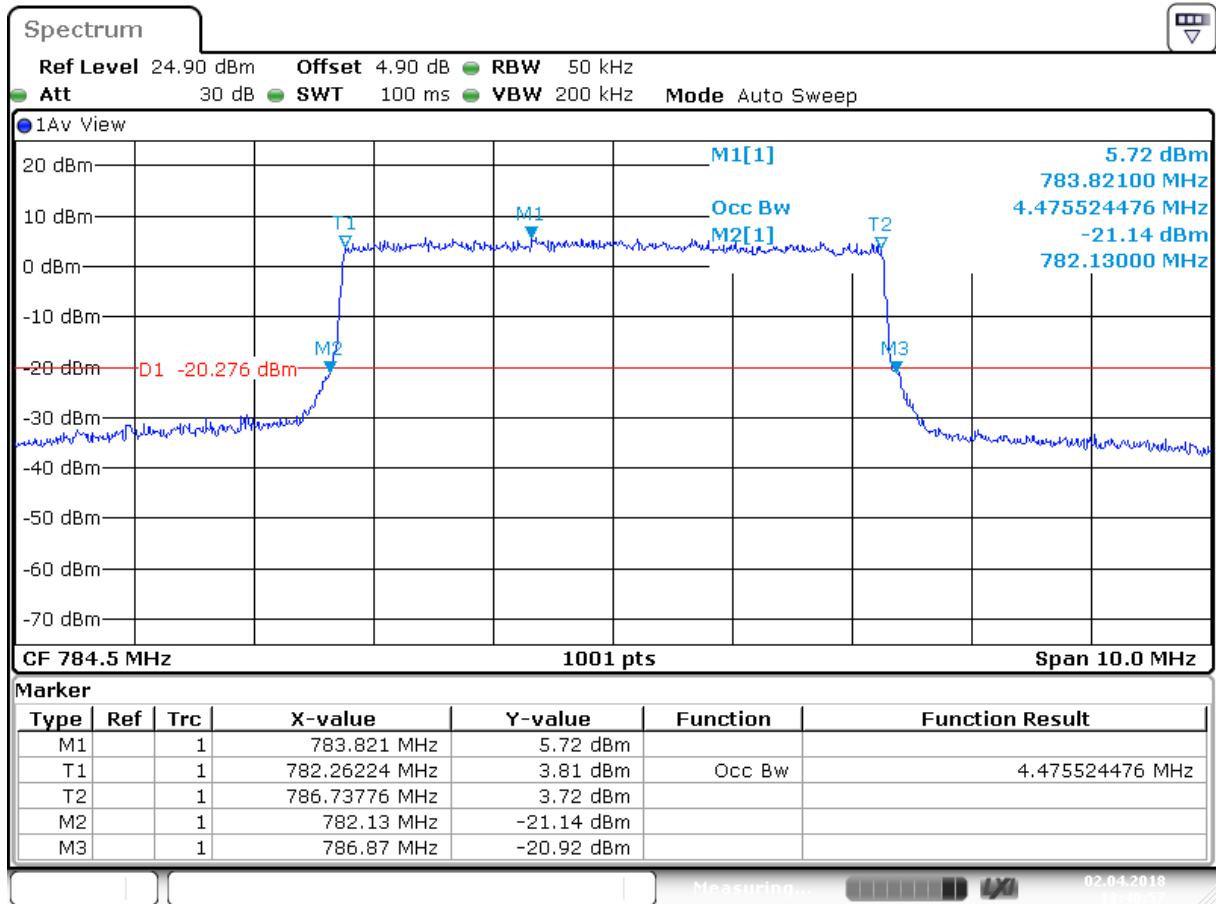
4.1.1.3 Test Mode = LTE/TM1 10MHz

4.1.1.3.1 Test Channel = MCH

Marker						
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	783.798 MHz	5.43 dBm		
T1		1	777.5445 MHz	2.78 dBm	Occ Bw	8.931068931 MHz
T2		1	786.4755 MHz	2.35 dBm		
M2		1	777.36 MHz	-21.66 dBm		
M3		1	786.64 MHz	-21.00 dBm		

Date:2 APR 2018 13:52:54

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
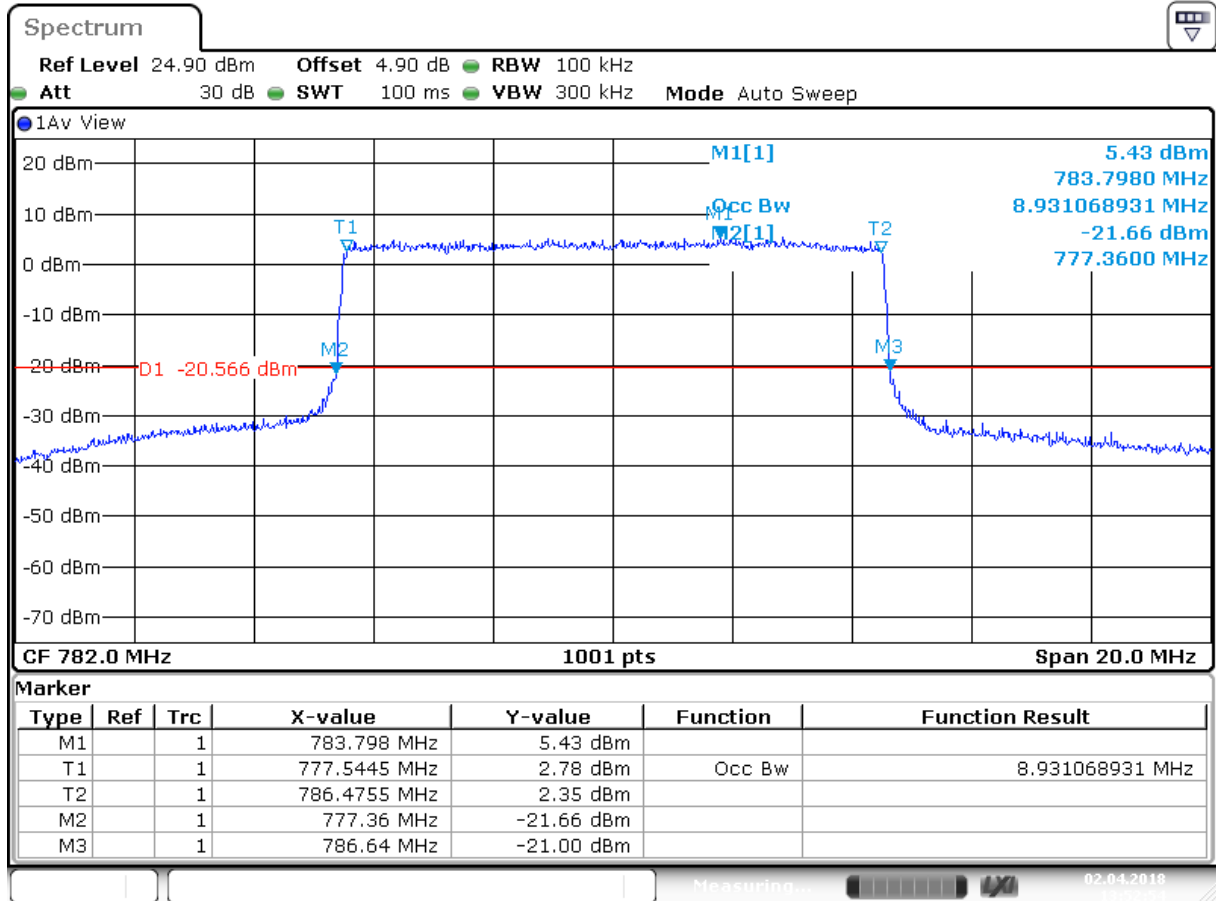
4.1.1.4   Test Mode = LTE/TM2 10MHz

4.1.1.4.1   Test Channel = MCH

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	783.778 MHz	4.19 dBm		
T1		1	777.5445 MHz	2.33 dBm	Occ Bw	8.911088911 MHz
T2		1	786.4555 MHz	2.87 dBm		
M2		1	777.34 MHz	-22.41 dBm		
M3		1	786.64 MHz	-22.34 dBm		
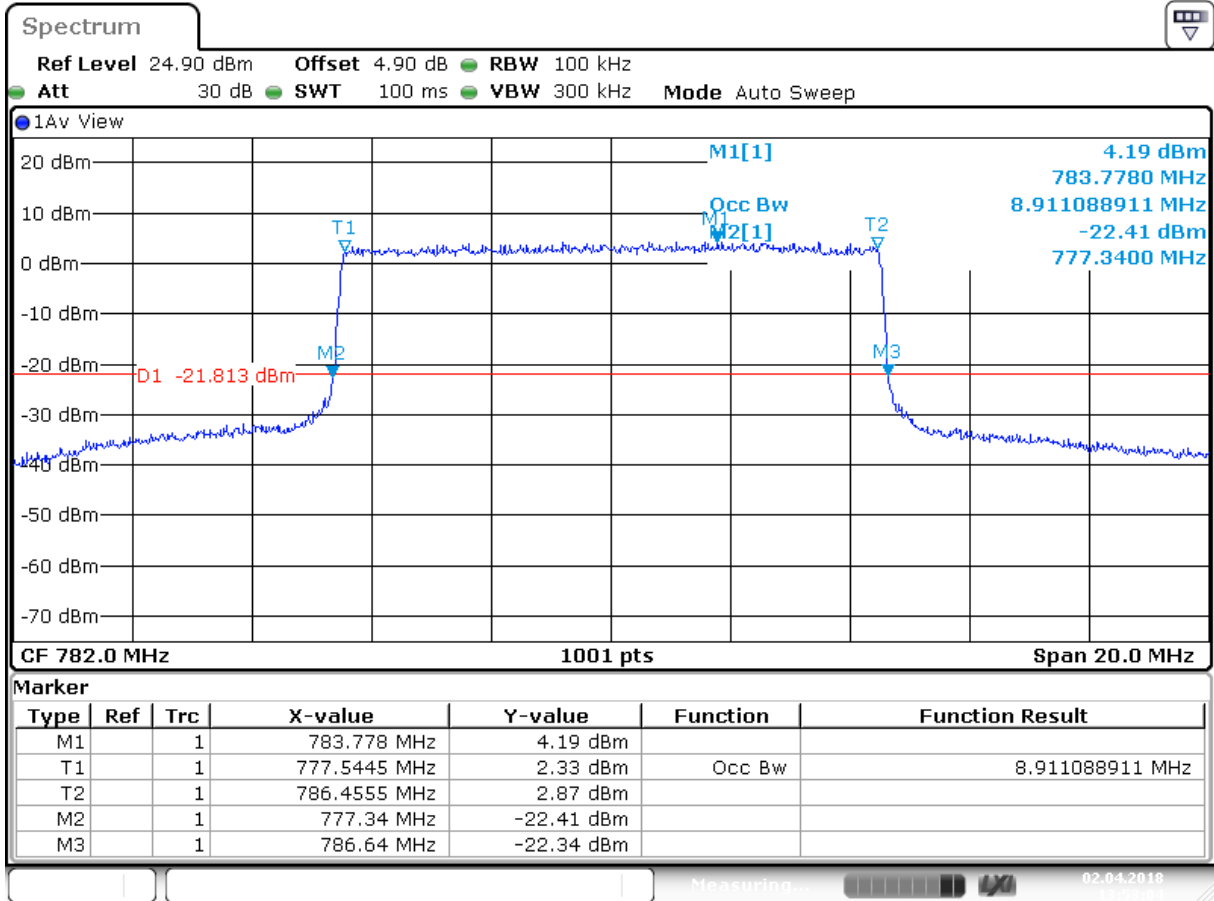
Date: 2 APR.2018 13:53:04

5   Band Edges Compliance

5.1 For LTE

5.1.1 Test Band = LTE BAND 13

5.1.1.1   Test Mode = LTE/TM1 5MHz

5.1.1.1.1   Test Channel = LCH

5.1.1.1.1.1 Test RB=1RB

Date: 12.APR.2018 09:18:30

SGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch
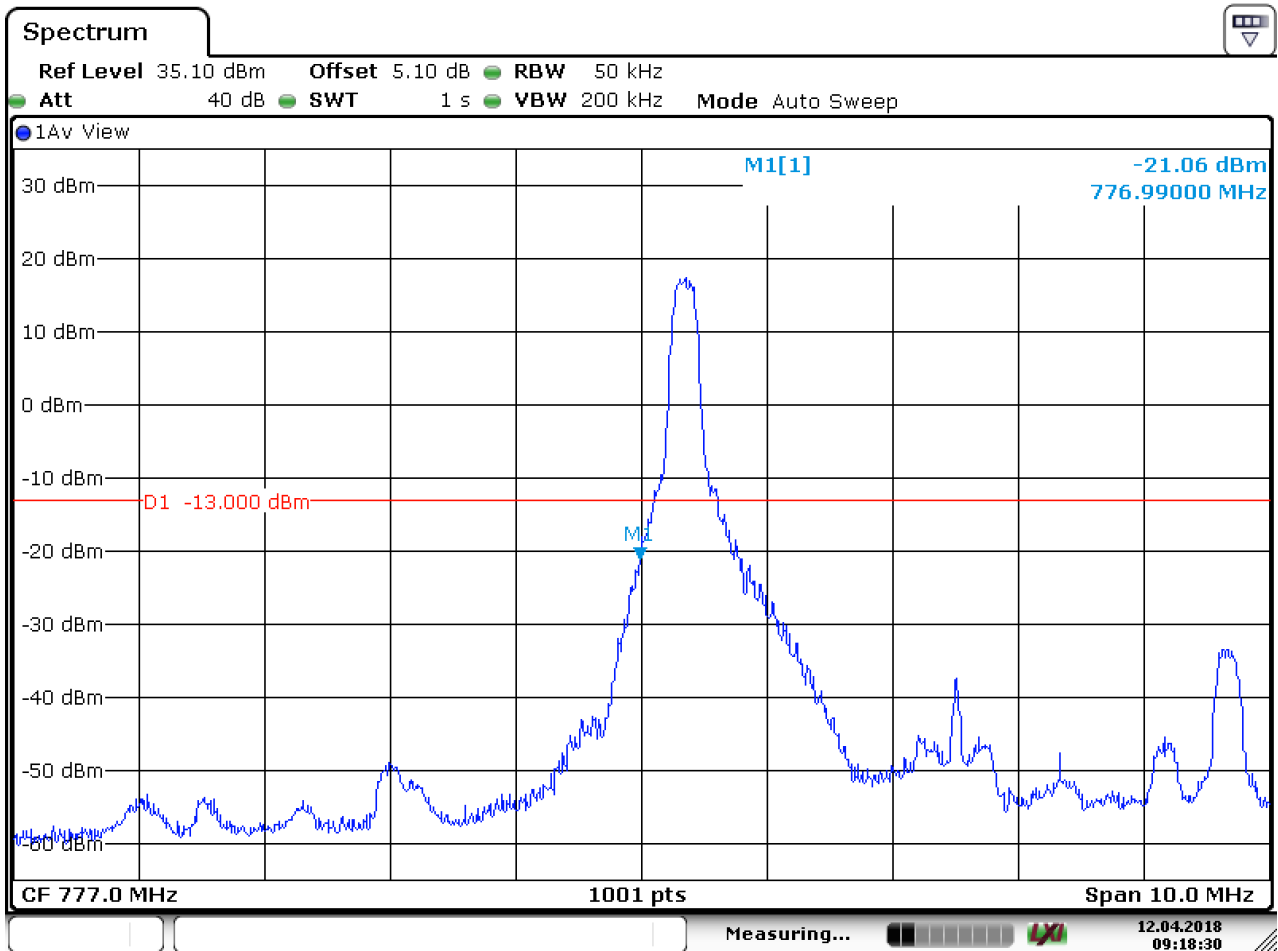
5.1.1.1.1.2 Test RB=25RB

Date: 12.APR.2018 09:17:29

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch
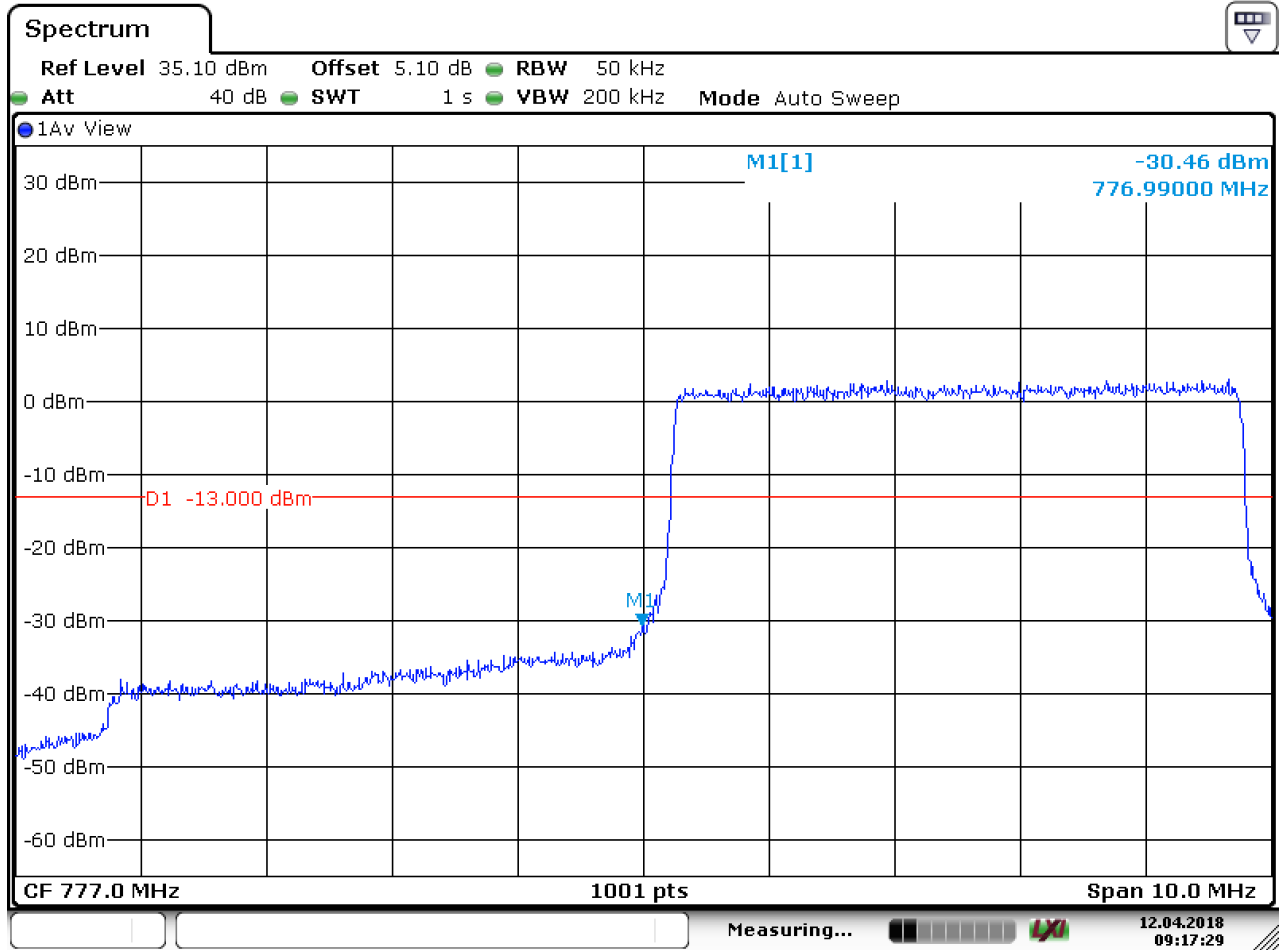
5.1.1.1.2   Test Channel = HCH

5.1.1.1.2.1 Test RB=1RB
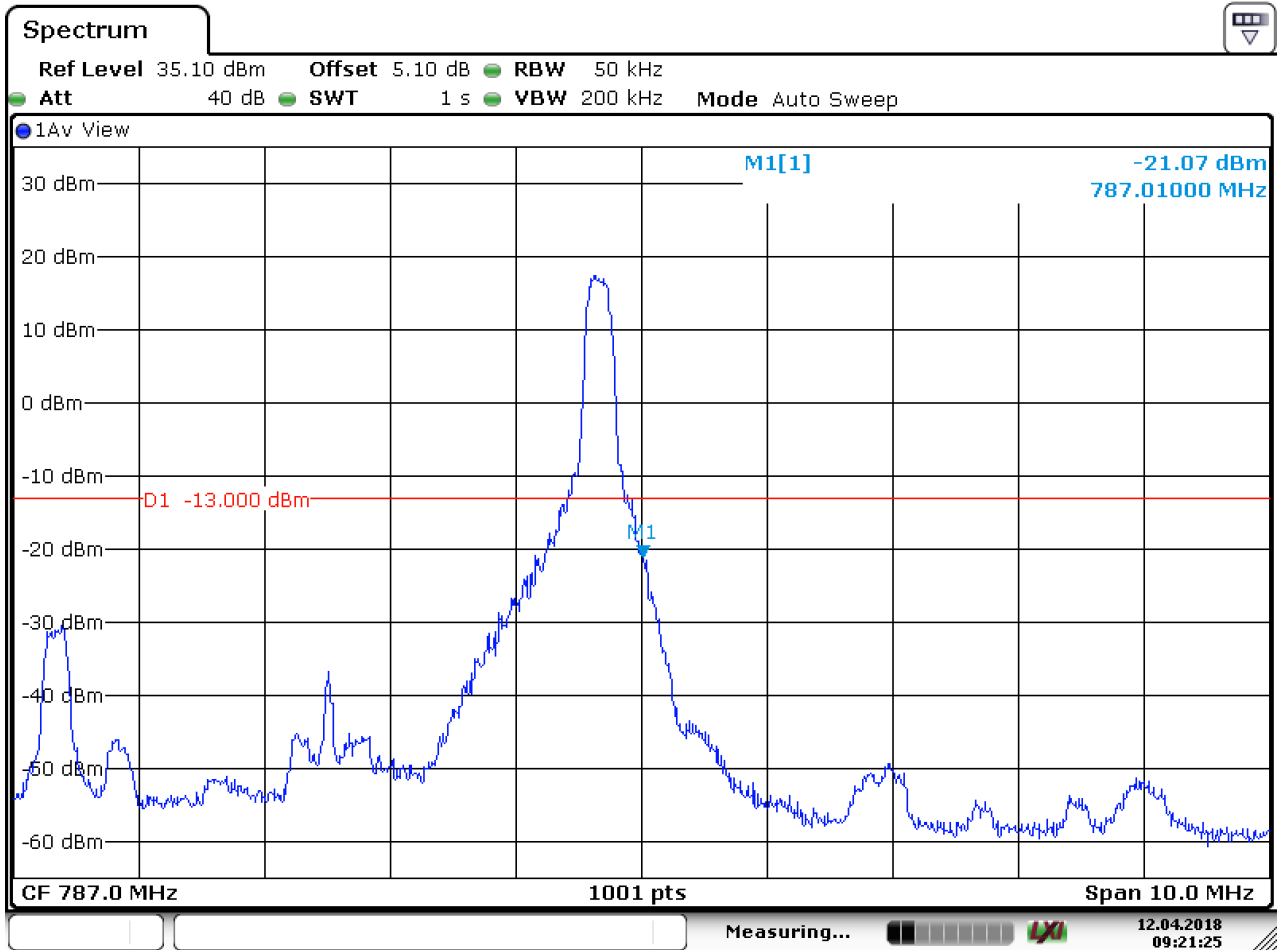
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5.1.1.1.2.2 Test RB=25RB
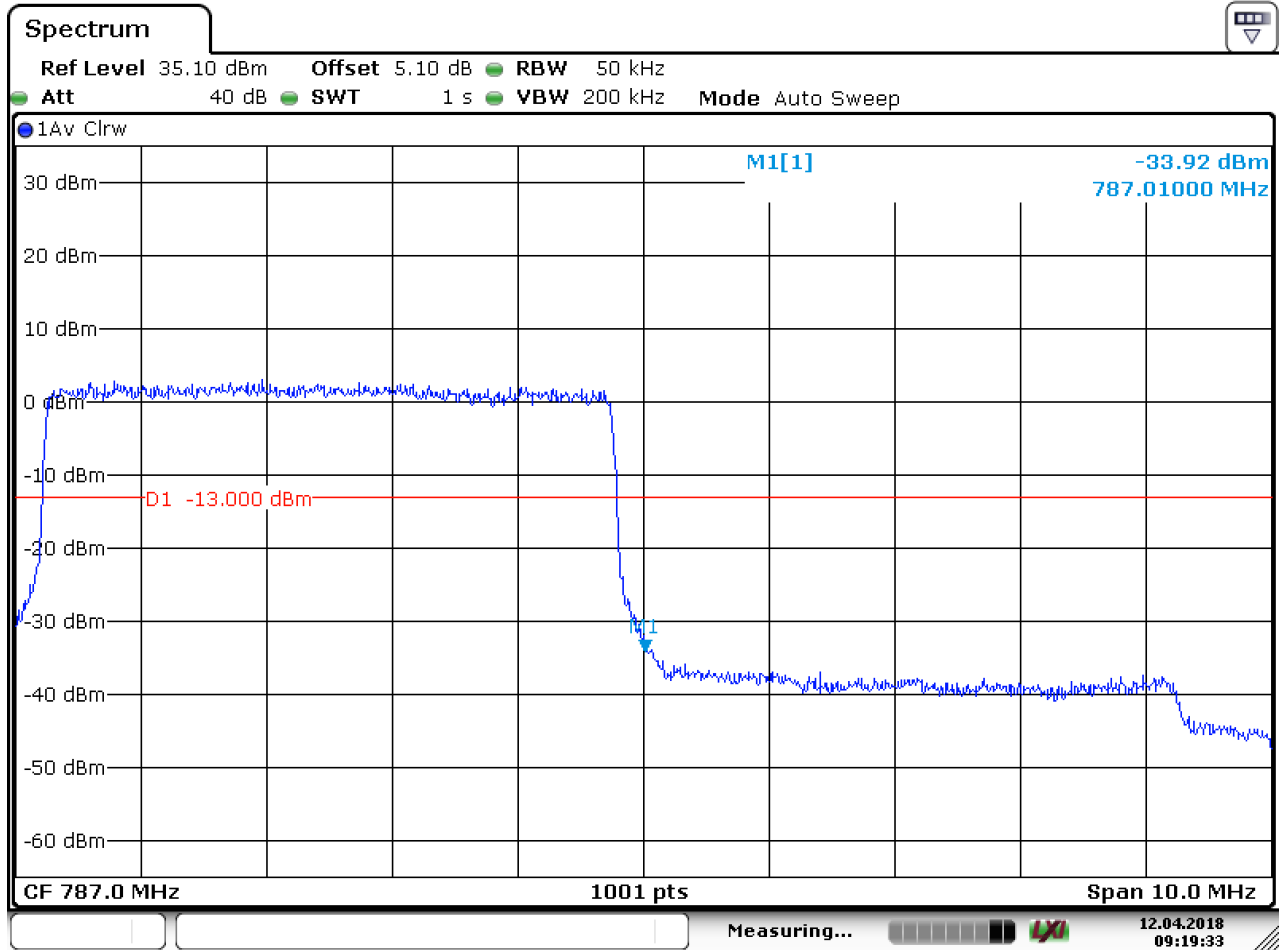
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5.1.1.2   Test Mode = LTE/TM2 5MHz

5.1.1.2.1   Test Channel = LCH

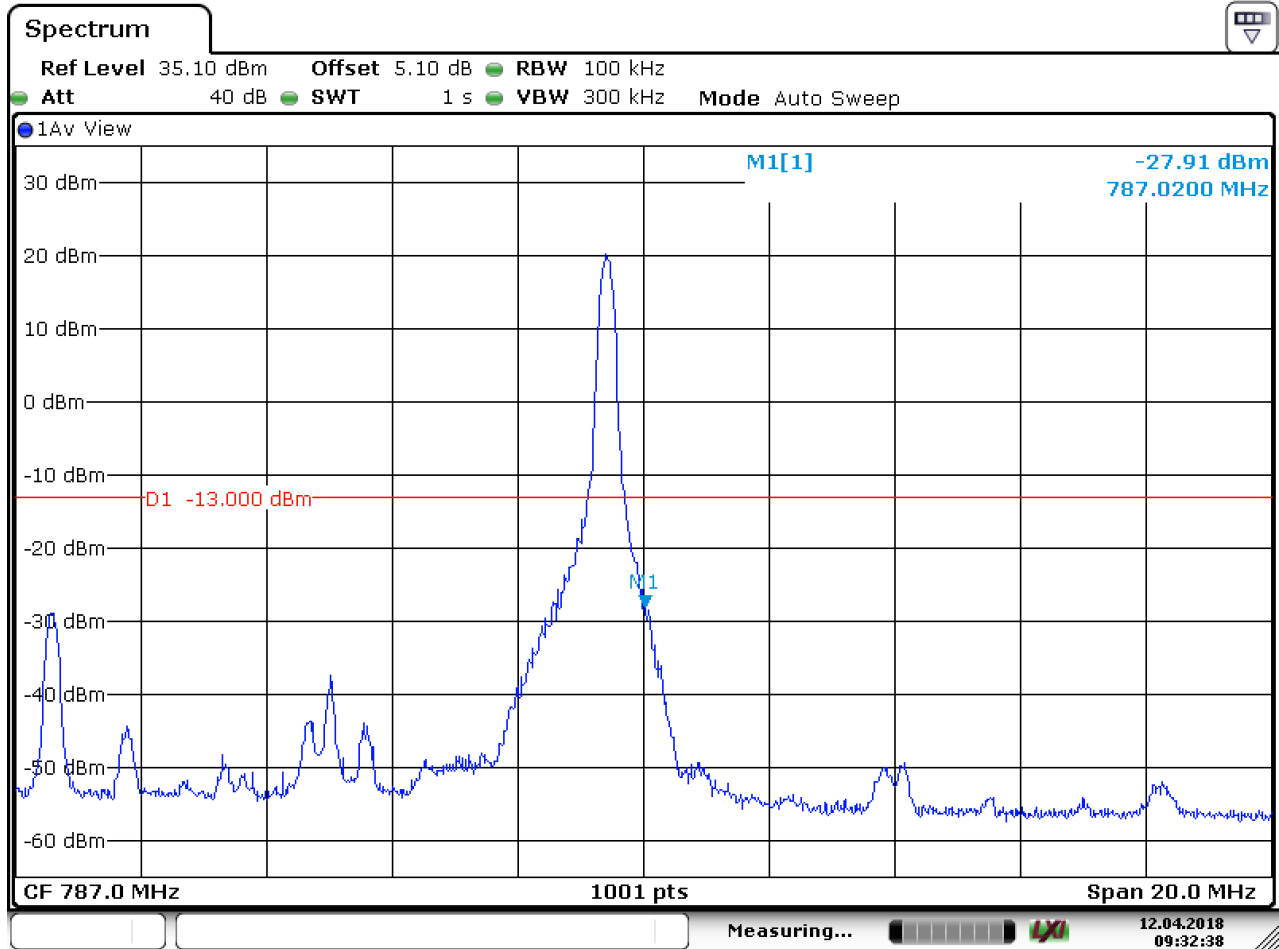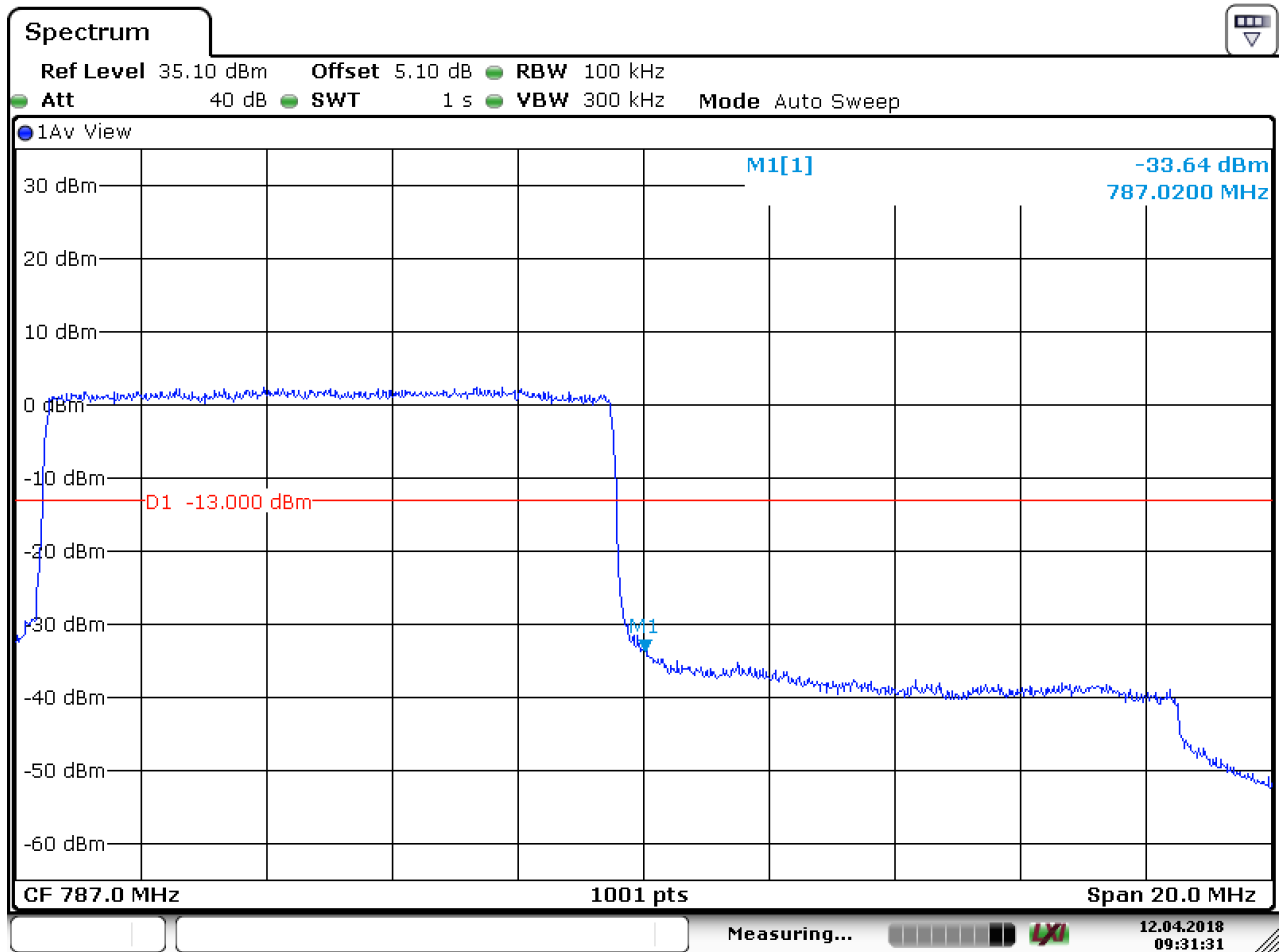**5.1.1.2.1.1 Test RB=1RB**
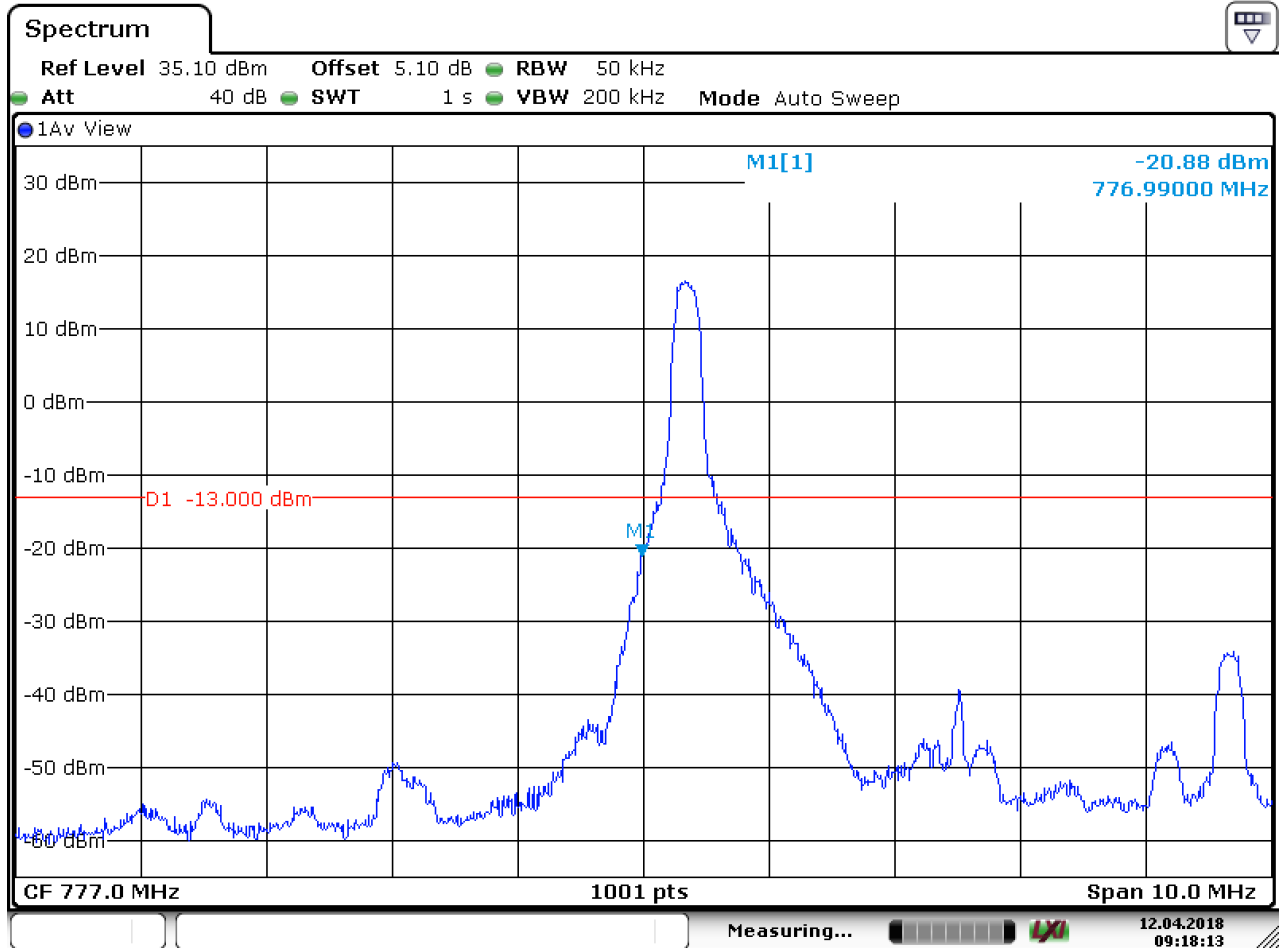
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5.1.1.2.1.2 Test RB=25RB
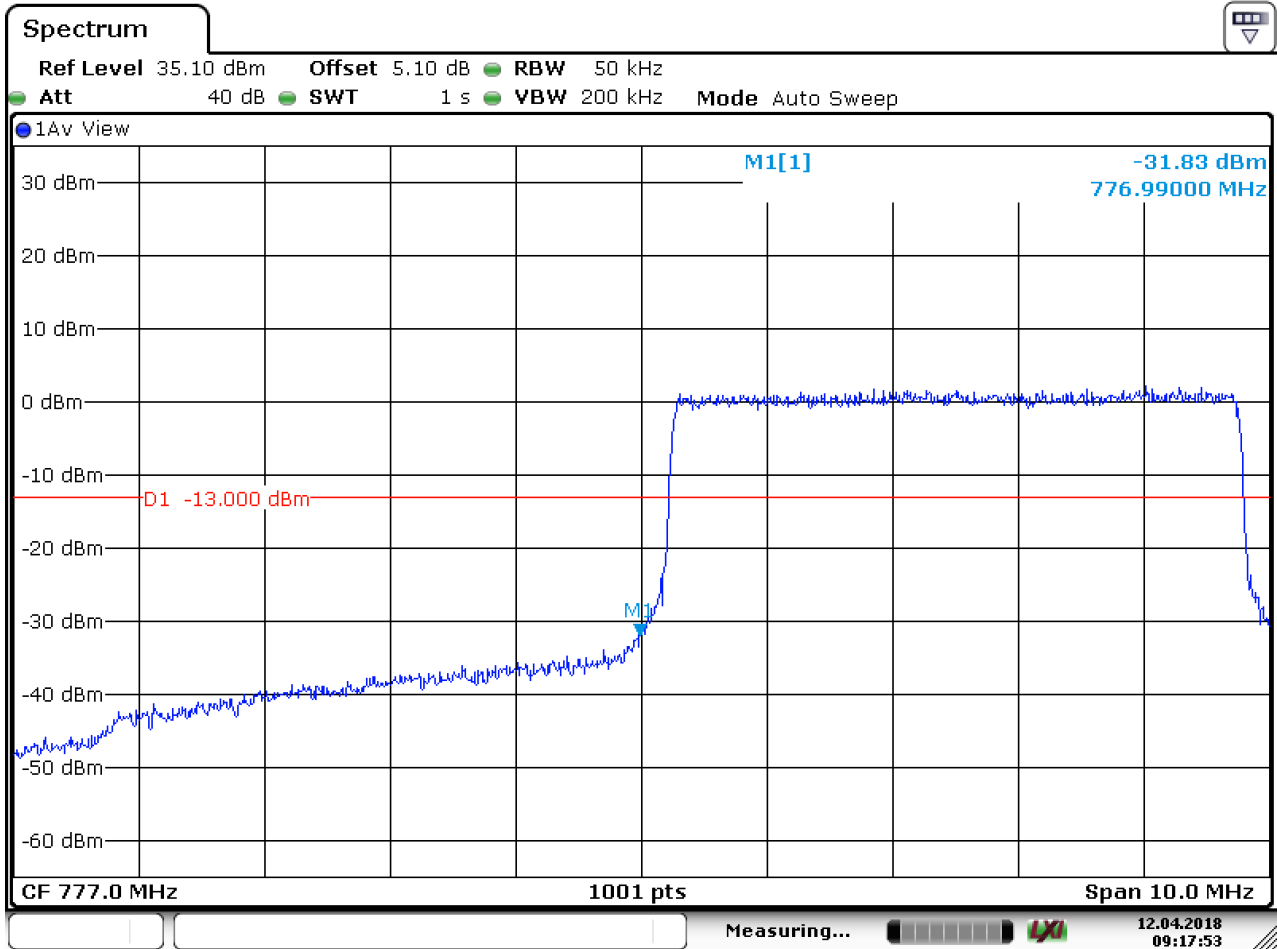
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5.1.1.2.2   Test Channel = HCH

5.1.1.2.2.1 Test RB=1RB
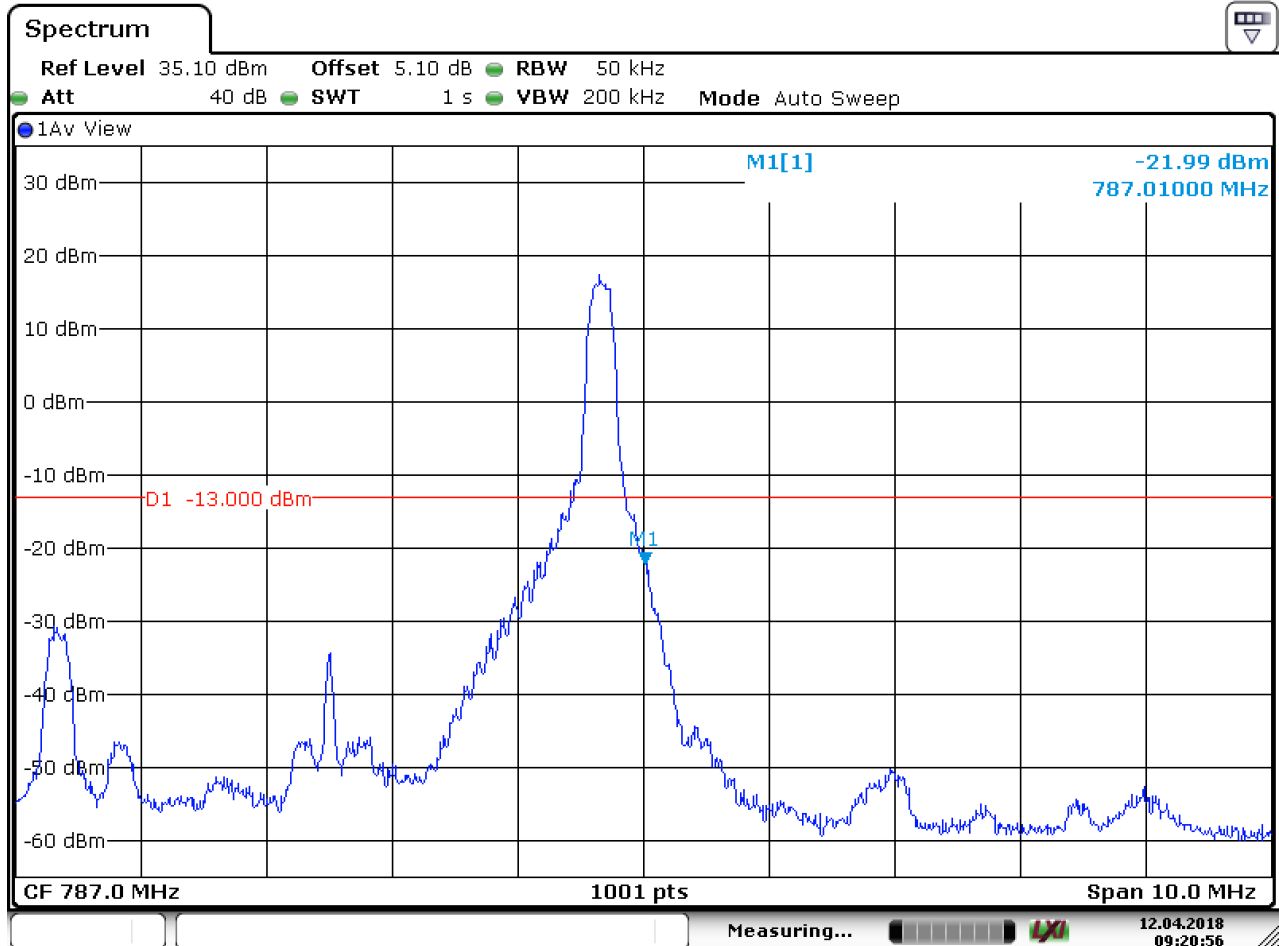
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5.1.1.2.2.2 Test RB=25RB
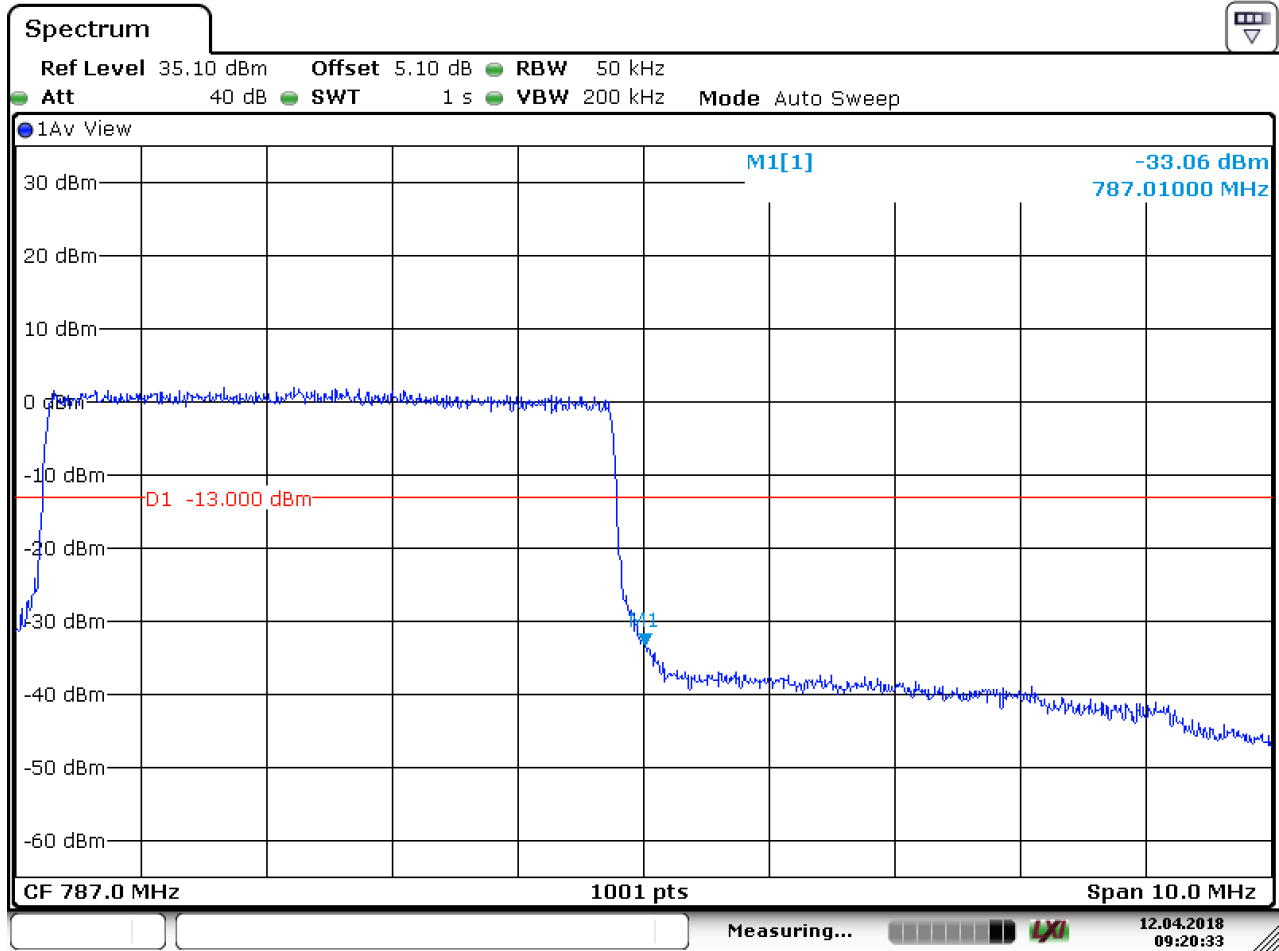
Date: 12.APR.2018 09:20:33

5.1.1.3   Test Mode = LTE/TM1 10MHz

5.1.1.3.1   Test Channel = LCH

5.1.1.3.1.1 Test RB=1RB
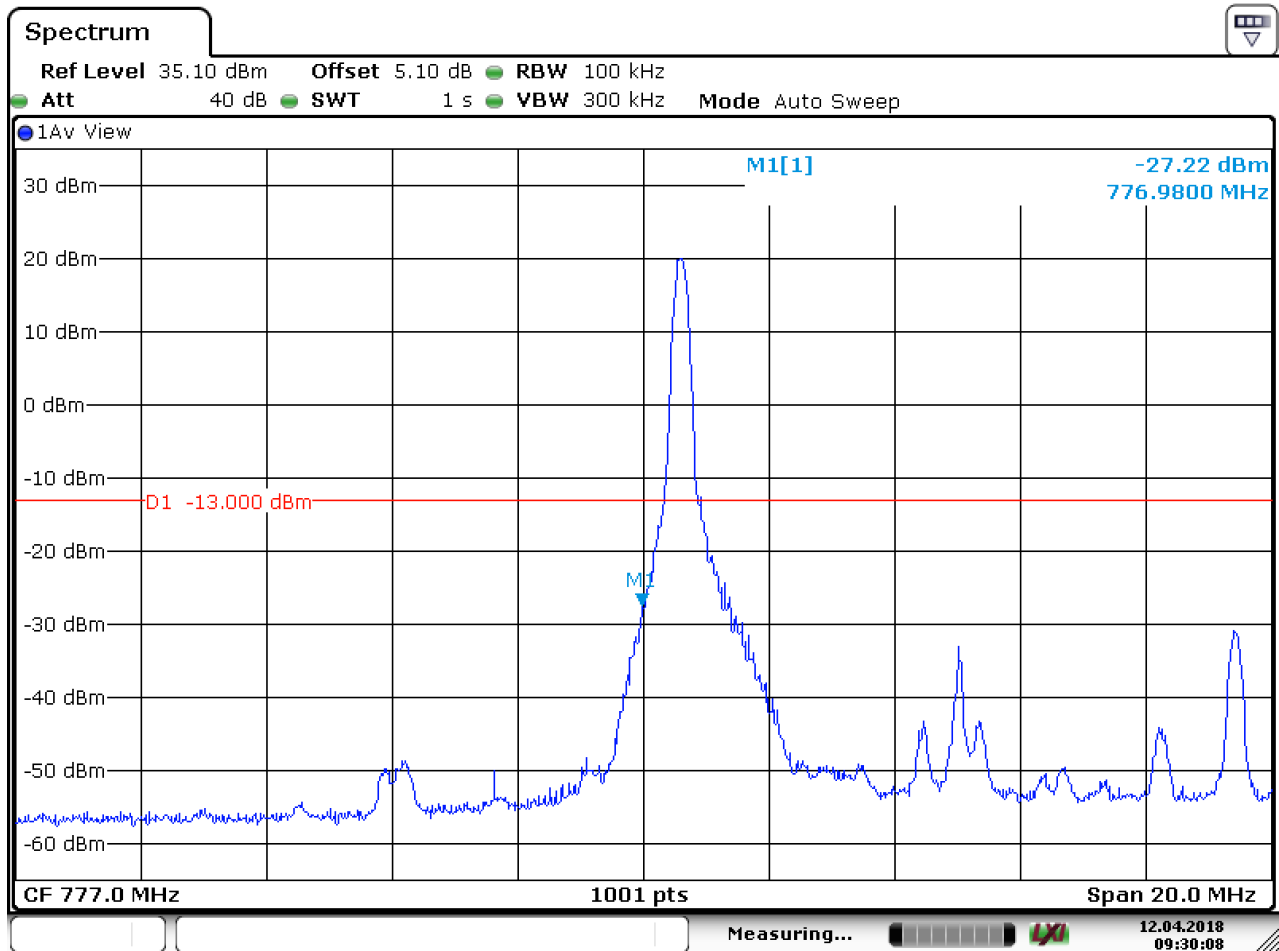
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5.1.1.3.1.2 Test RB=50RB
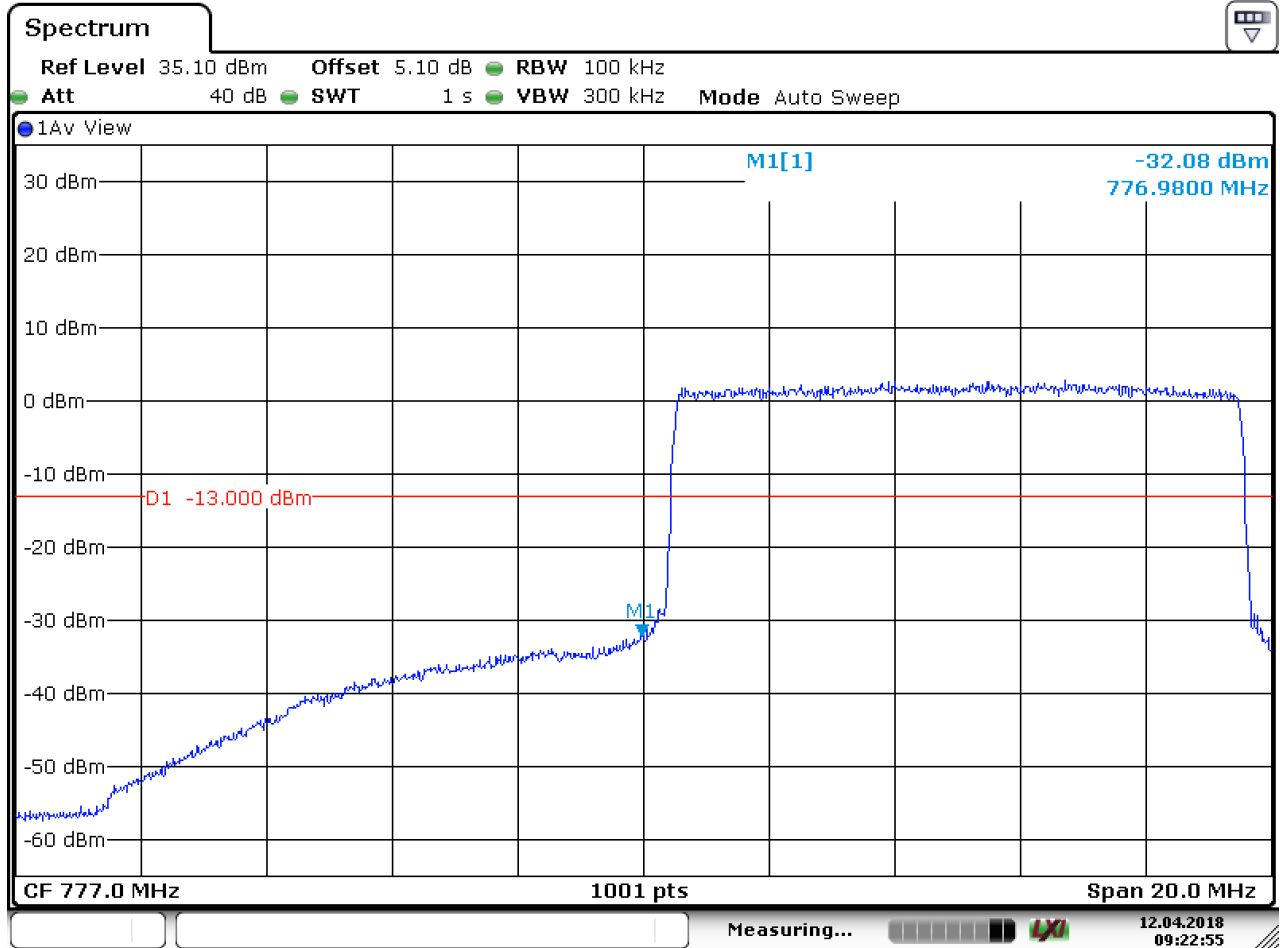
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5.1.1.3.2   Test Channel = HCH

5.1.1.3.2.1 Test RB=1RB

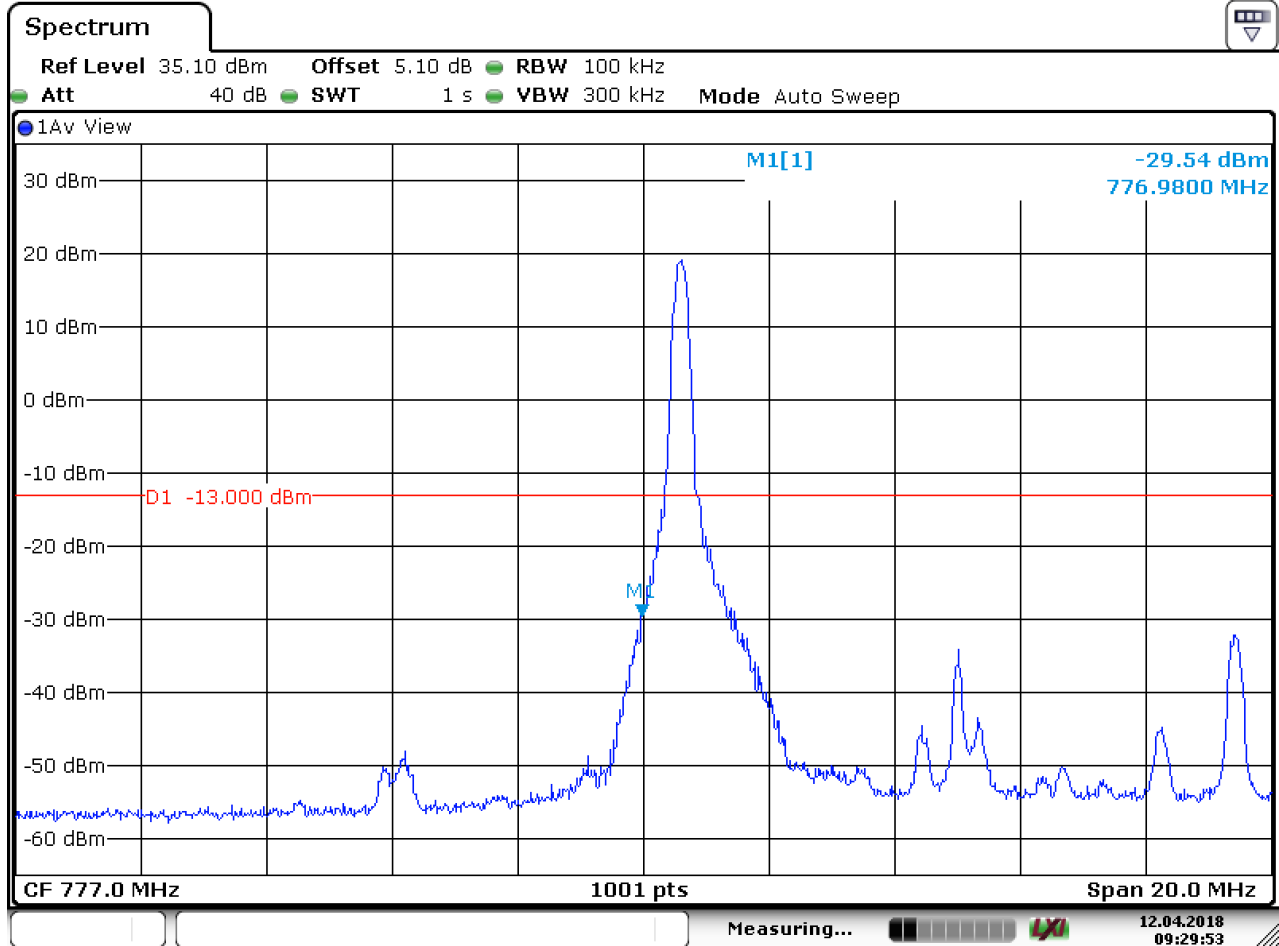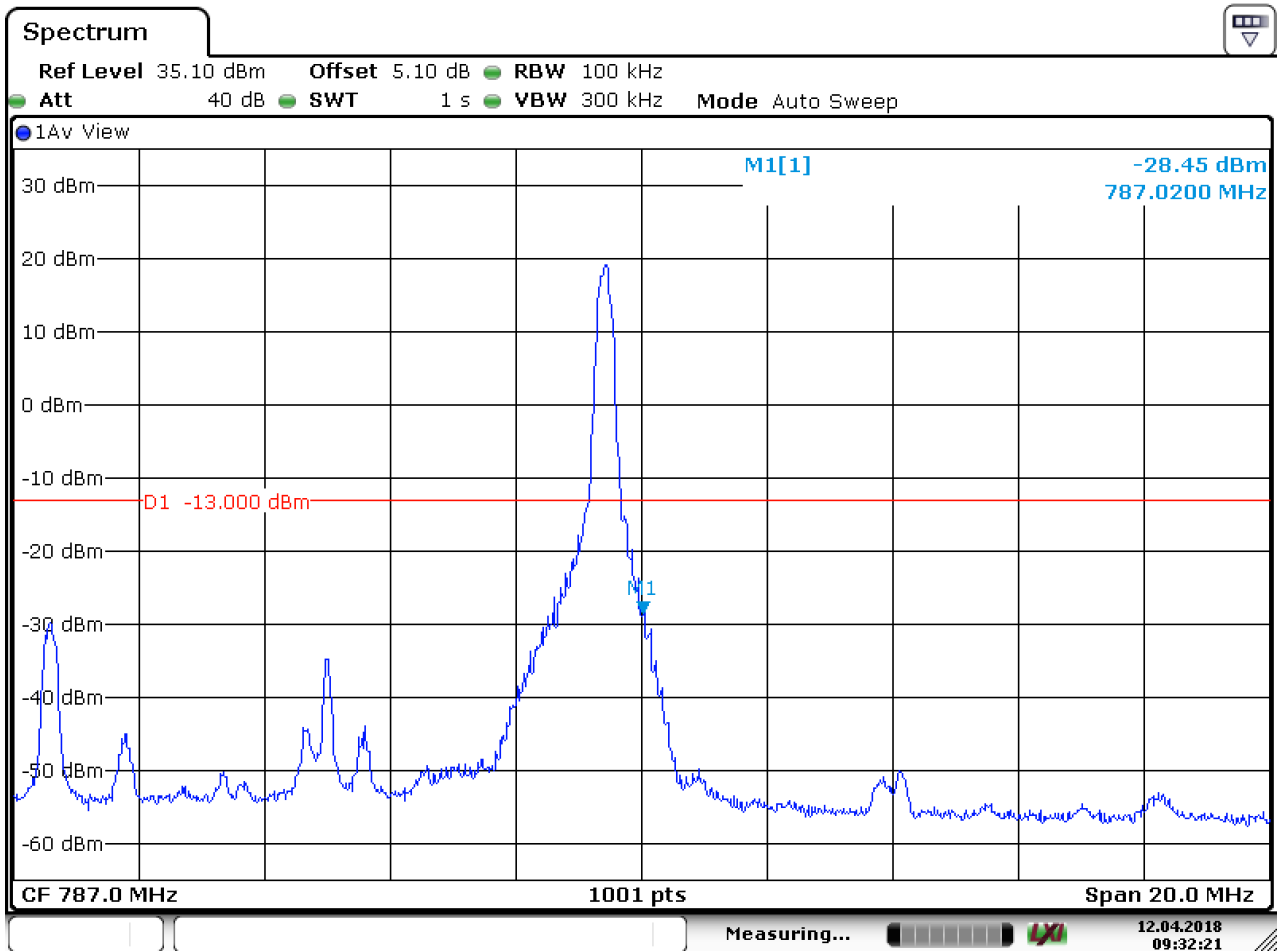Date: 12.APR.2018 09:32:38

5.1.1.3.2.2 Test RB=50RB

Date: 12.APR.2018 09:31:32

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5.1.1.4 Test Mode = LTE/TM2 10MHz

5.1.1.4.1 Test Channel = LCH

5.1.1.4.1.1 Test RB=1RB

Date: 12.APR.2018 09:29:54

5.1.1.4.1.2 Test RB=50RB

Date: 12.APR.2018 09:29:18

SGS-CSTC Standards Technical Services Co., Ltd.
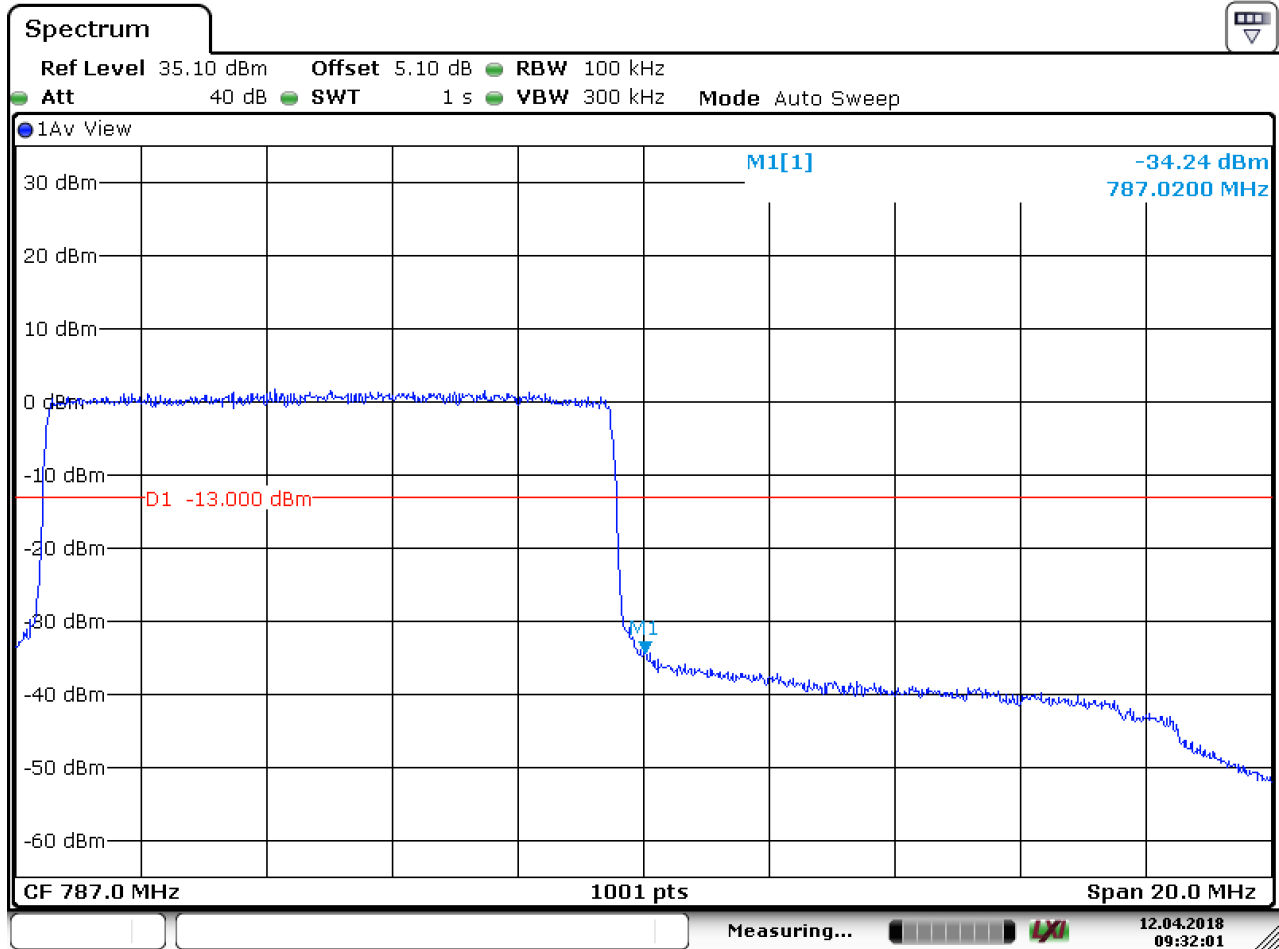Shenzhen Branch
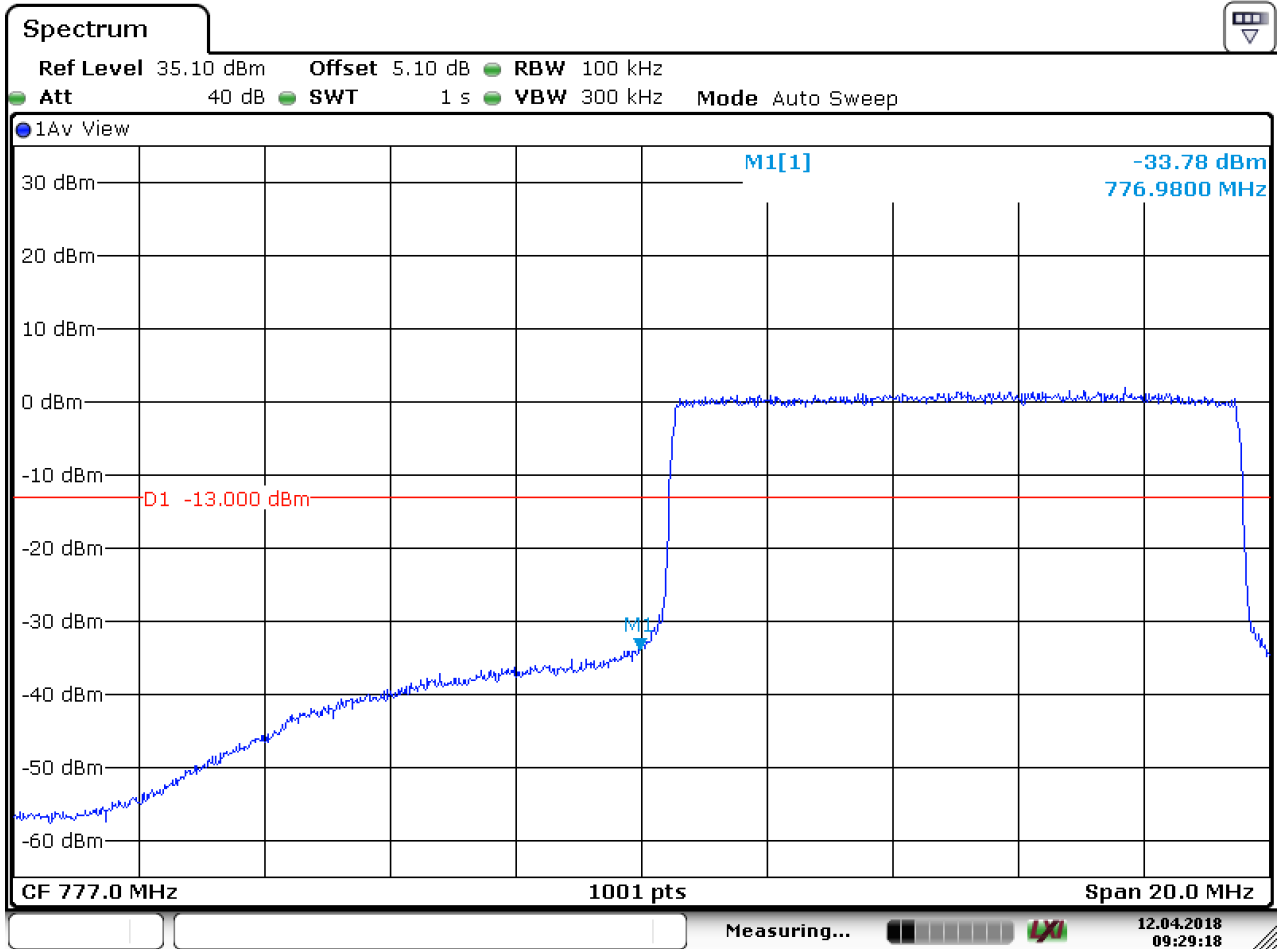
5.1.1.4.2   Test Channel = HCH

5.1.1.4.2.1 Test RB=1RB

Date: 12.APR.2018 09:32:22

5.1.1.4.2.2 Test RB=50RB

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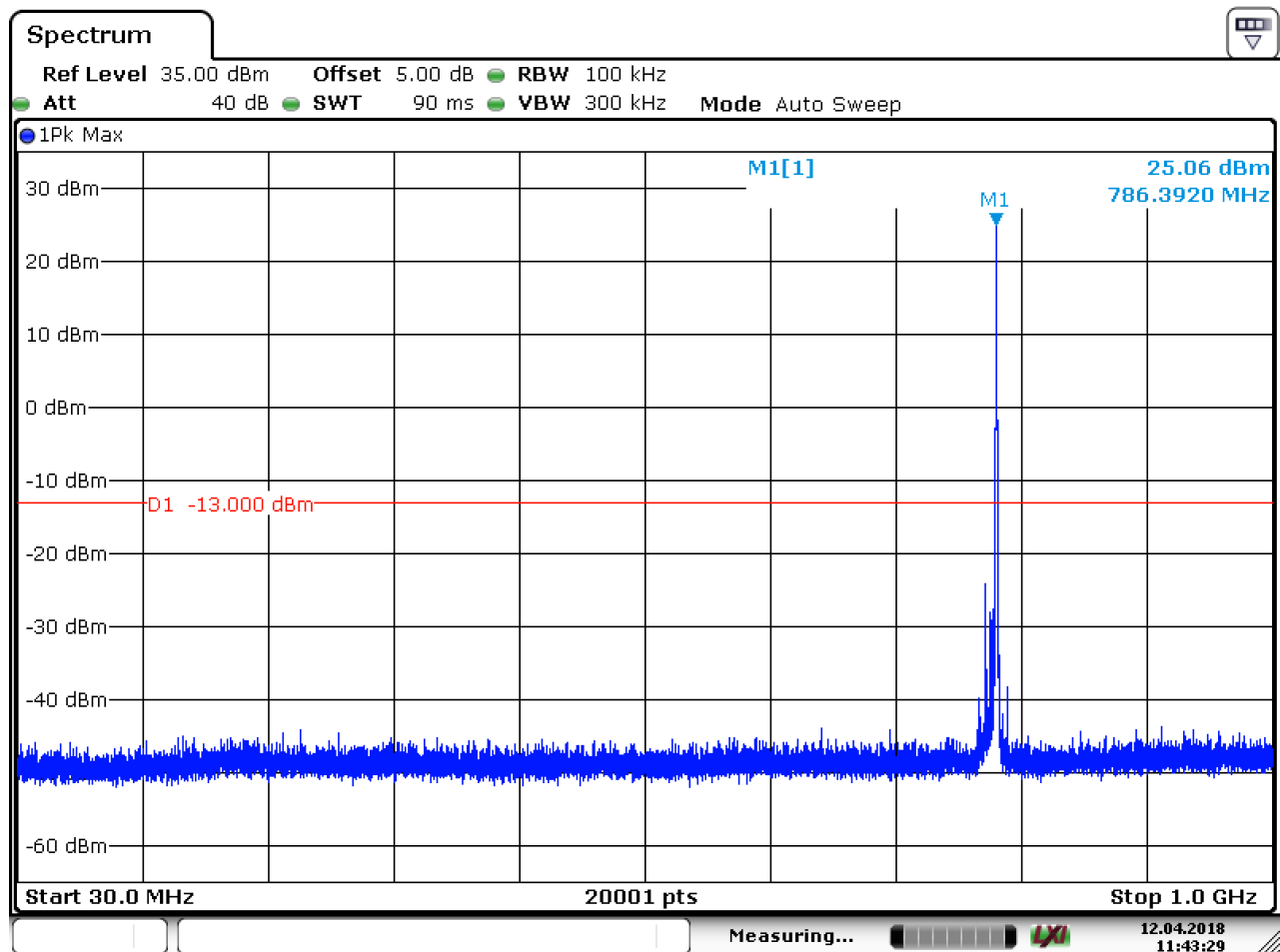
6   Spurious Emission at Antenna Terminal

NOTE: For the averaged unwanted emissions measurements, the measurement points in each sweep is greater than twice the Span/RBW in order to ensure bin-to-bin spacing of < RBW/2 so that narrowband signals are not lost between frequency bins. As to the present test item, the "Measurement Points = k * (Span / RBW)" with k between 4 and 5, which results in an acceptable level error of less than 0.5 dB.

Part I - Test Plots

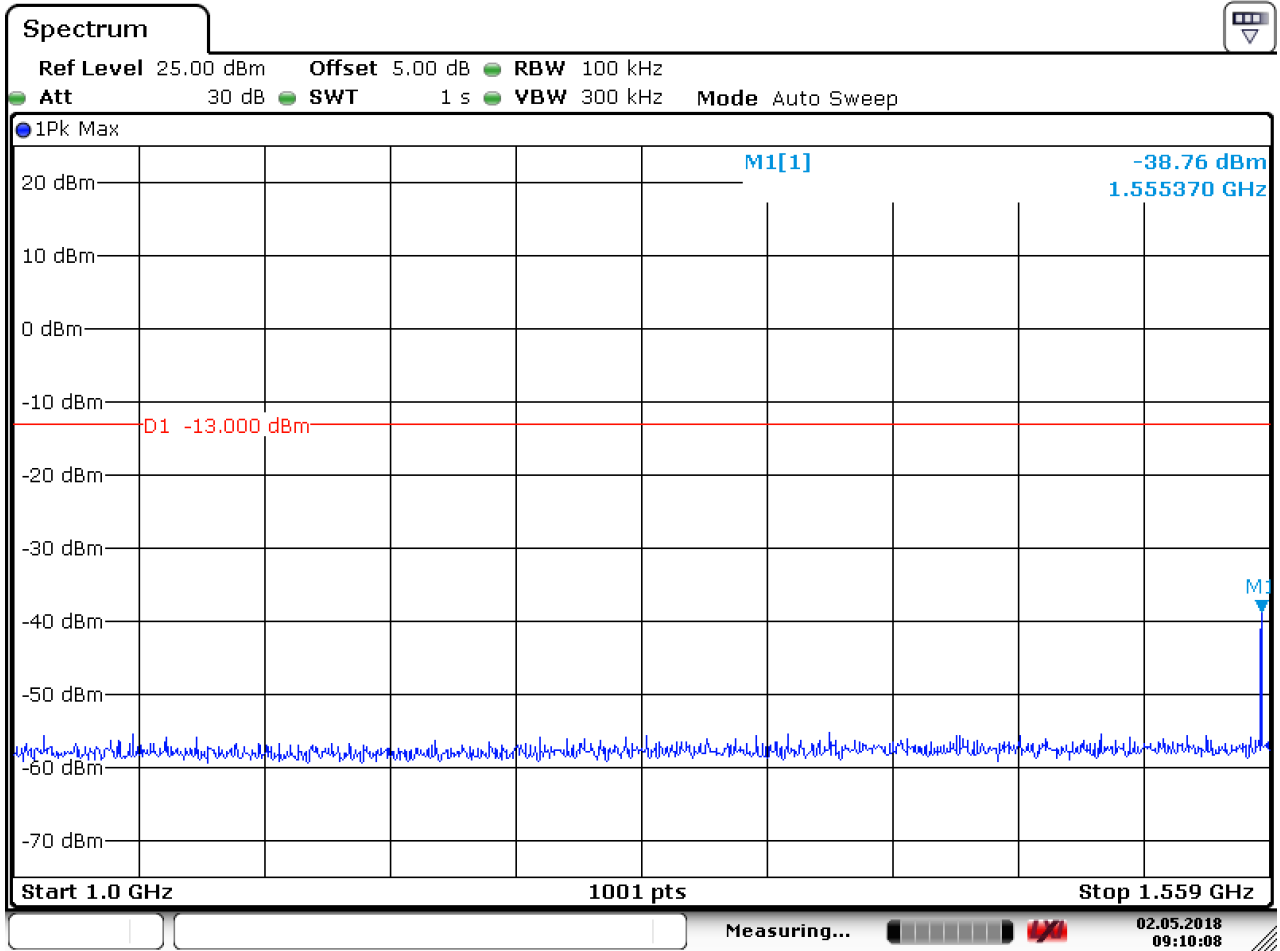## 6.1 For LTE

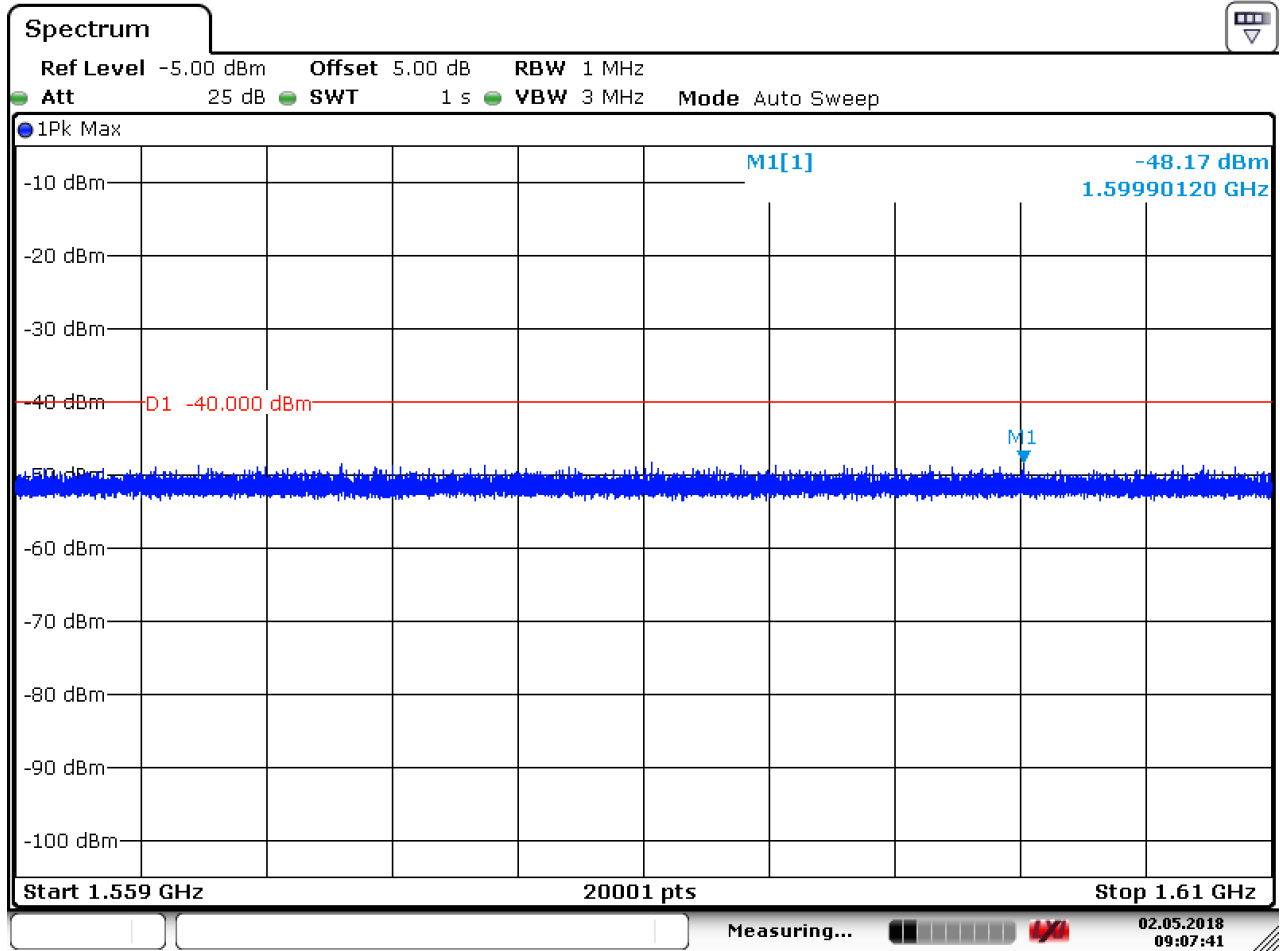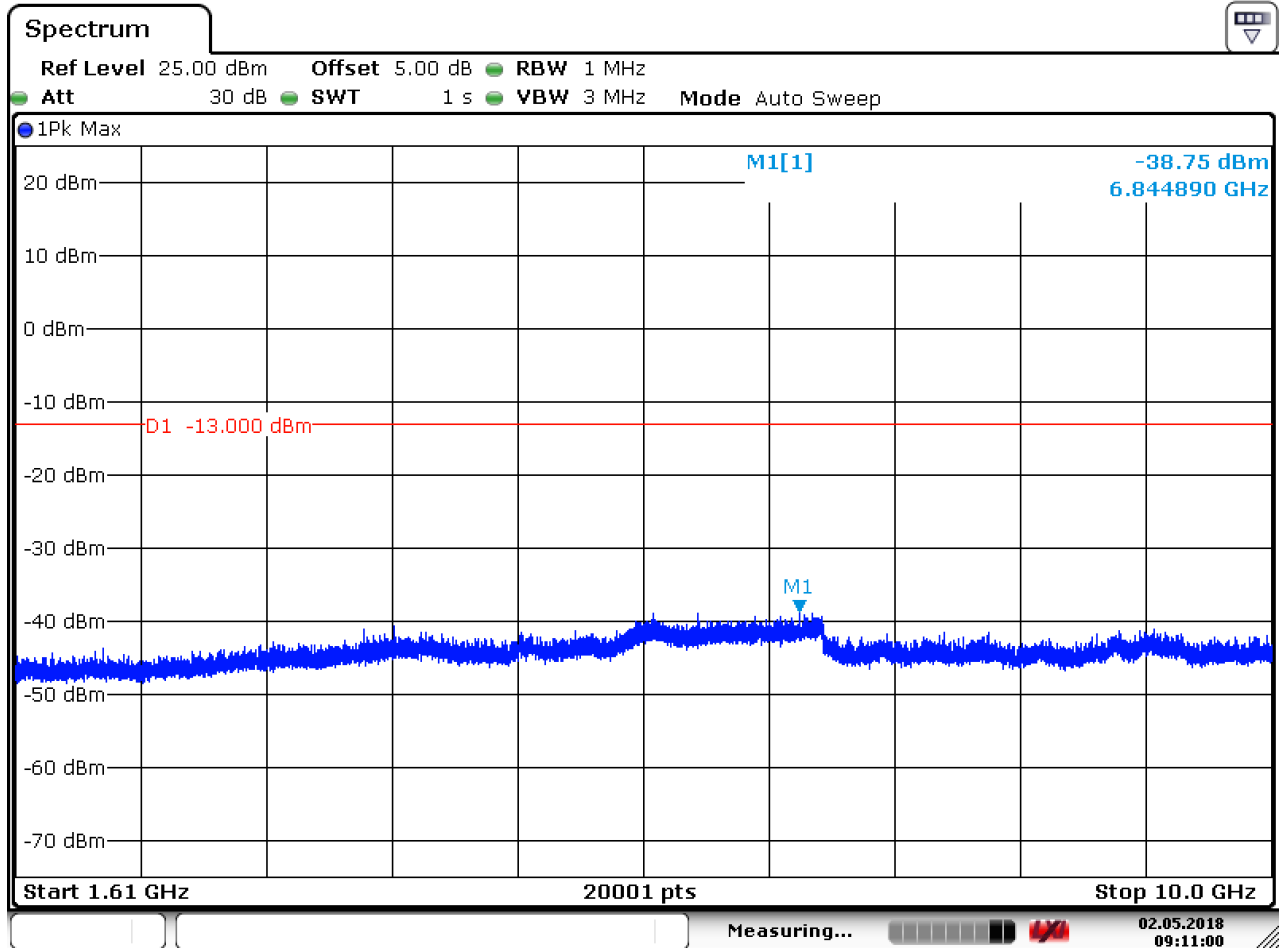### 6.1.1.1   Test Mode = LTE / TM1 10MHz RB1#0

6.1.1.1.1   Test Channel = MCH

Date: 12.APR.2018 11:43:29

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Date: 2.MAY.2018 09:10:08

Date: 2.MAY.2018 09:07:42

Date: 2.MAY.2018 09:11:01

7   Field Strength of Spurious Radiation

7.1 For LTE

7.1.1 Test Band = LTE BAND 13

7.1.1.1   Test Mode =LTE/TM1 10MHz RB1#0

7.1.1.1.1   Test Channel = MCH

Frequency (MHz)	Level (dBm)	Limit Line (dBm)	Over Limit (dB)	Polarization
67.053333	-78.93	-13.00	65.93	Vertical
124.966667	-84.22	-13.00	71.22	Vertical
1097.000000	-63.07	-13.00	50.07	Vertical
4643.850000	-67.13	-13.00	54.13	Vertical
7940.812500	-63.66	-13.00	50.66	Vertical
11248.500000	-63.38	-13.00	50.38	Vertical
63.460000	-77.84	-13.00	64.84	Horizontal
104.340000	-85.44	-13.00	72.44	Horizontal
621.508333	-79.19	-13.00	66.19	Horizontal
1196.000000	-67.13	-13.00	54.13	Horizontal
4338.187500	-67.13	-13.00	54.13	Horizontal
7813.575000	-64.32	-13.00	51.32	Horizontal

NOTE:

1) All modes are tested,but the data presented above is the worst case.the disturbance above 13GHz and below 30MHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

2) We have tested all modulation and all Bandwidth, but only the worst case data presented in this report.

8   Frequency Stability

8.1 Frequency Error VS. Voltage

Test Band	Test Mode	Test Channel	Test Temp.	Test Volt.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
LTE BAND 13	LTE/TM1 10MHz	MCH	TN	VL	-4.66	-0.005959	PASS
				VN	4.08	0.005217	PASS
				VH	-5.19	-0.006637	PASS
	LTE/TM2 10MHz	MCH	TN	VL	5.64	0.007212	PASS
				VN	5.81	0.007430	PASS
				VH	6.37	0.008146	PASS

8.2 Frequency Error VS. Temperature

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
LTE BAND 13	LTE/TM1 10MHz	MCH	VN	-30	-4.18	-0.005345	PASS
				-20	4.61	0.005895	PASS
				-10	4.41	0.005639	PASS
				0	4.38	0.005601	PASS
				10	4.53	0.005793	PASS
				20	-4.66	-0.005978	PASS
				30	-4.59	-0.005888	PASS
				40	-4.51	-0.005786	PASS
				50	3.89	0.004974	PASS

Test Band	Test Mode	Test Channel	Test Volt.	Test Temp.	Freq. Error [Hz]	Freq. vs. rated [ppm]	Verdict
LTE BAND 13	LTE/TM2 10MHz	MCH	VN	-30	4.98	0.006368	PASS
				-20	4.35	0.005563	PASS
				-10	6.08	0.007775	PASS
				0	5.59	0.007148	PASS
				10	5.54	0.007084	PASS
				20	-5.32	-0.006825	PASS
				30	-5.05	-0.006437	PASS
				40	-4.62	-0.005889	PASS
				50	3.23	0.004117	PASS

The End